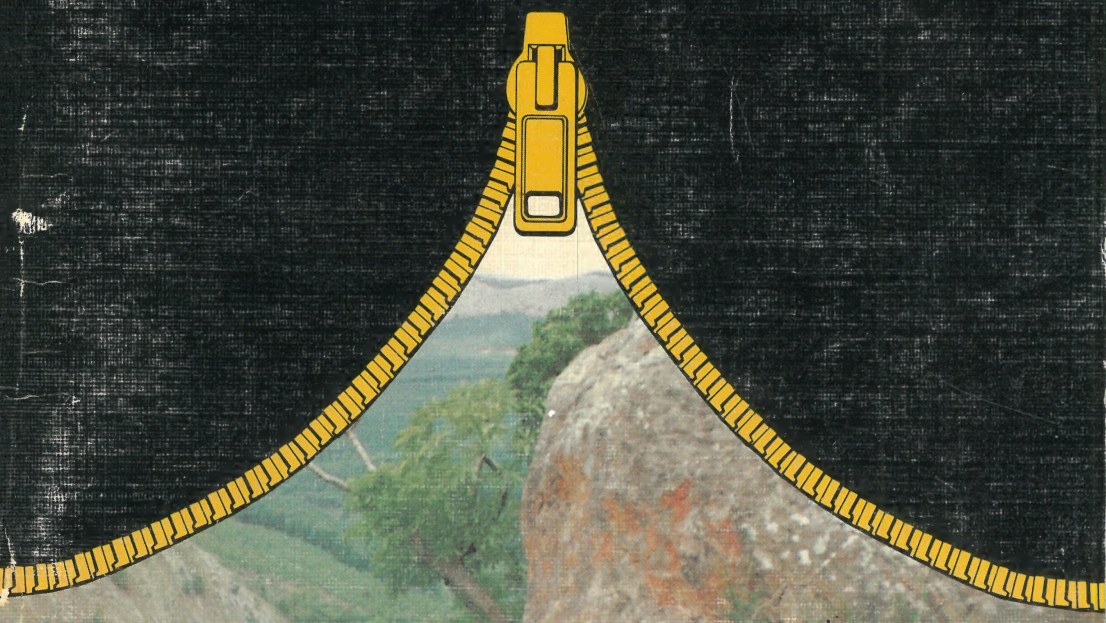
EARTHLINK

Survival guide to the Outdoors



by

JAMES CLARKE

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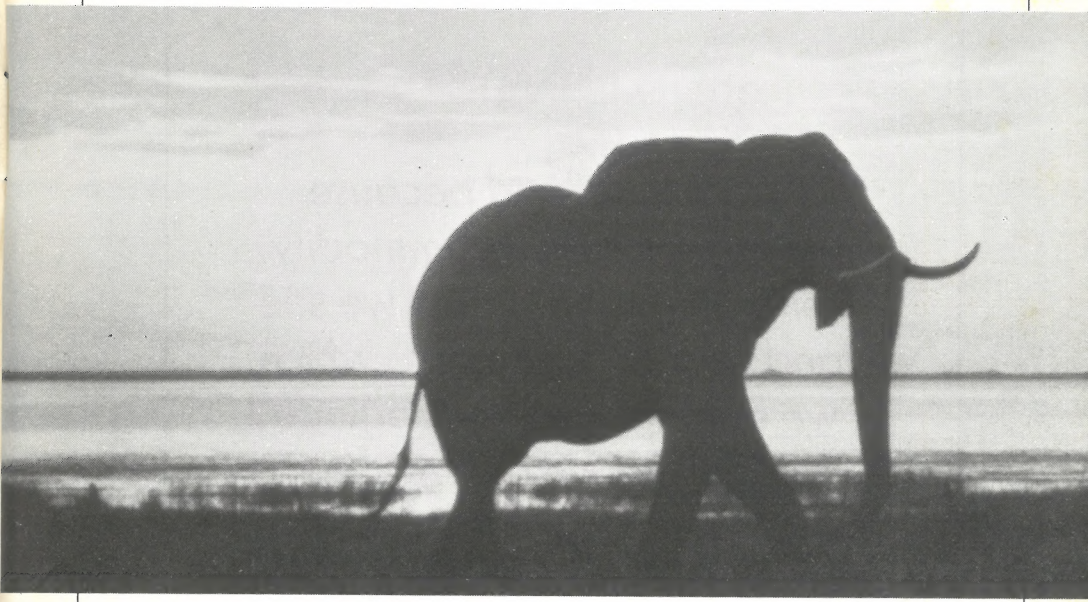
'AT LEAST ONE WILDLIFE SPECIES IS MADE EXTINCT EVERY DAY.'
DAVID SHEPHERD



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"We abuse land because we regard it as a commodity belonging to us. When we see land as a commodity to which we belong, we may begin to use it with love and respect"

ALDO LEOPOLD

Survival Guide to the Outdoors

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James Clarke

ERRATA

Page 45. Paragraph 1. Text should read "... true North on your compass is 20 degrees to the RIGHT of the needle."

Page 45. Arrow in illustration has been reversed.

Page 49. Box. Text should read "Try to indicate a wind direction by making a conspicuous "T", the crosspiece of which is upwind."

Page 75: Paragraph 1. 100 ft should read 1000 ft

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"The unfit die - the fit both live and thrive.

Alas, who say so? They who do survive."

Sarah N. Cleghorn in Survival of the Fittest.

This book is dedicated to Timothy Nourse

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Introduction

In 1987 a man's car broke down on a lonely road near Swakopmund in Namibia and he spent three days standing next to it in the desert. The police eventually found him nearly dead from thirst. Some years before, in the Kalahari, a geologist abandoned his broken-down car on a public road leaving a note saying he had gone to look for water. His half-eaten body was found days later — surrounded by jackal spoor — only metres from his vehicle. His tracks revealed he had wandered in circles before collapsing.

In the bushveld and the mountains there are many sad stories of people dying of exposure or thirst. There are also stories of people killed by wild animals.

In the art of survival there is no doubt that quite often a little knowledge, far from being a dangerous thing, saves lives.

This book is about just that: how to survive. What, for instance, should be the contents of a survival kit? Are the standard snake bite kits adequate in the lowveld? (The answer is "No" by the way). What animals are dangerous? What should you do if confronted by a lion or a hippo?

This book is written not only for backpackers and field workers who head for remote places but is also aimed at caravaners and campers, and at the growing number of people who strike out into little frequented territory in 4-wheel drive vehicles.

There are a few books on survival but only one on our area and that deals mostly with Zimbabwe ("Don't Die in the Bundu" by Col. D.H. Grainger) and was written more that 30 years ago.

One word of caution about this book — it describes ways of capturing and killing animals and those of us who have produced this book trust that not only will the reader kill only if absolutely necessary but that having set traps he will remove all of them when leaving an area.

I should thank a number of people but there is room for only a few: John Pitts for the snake photographs. Dr A P Zinn of Witbank who was extremely helpful as were Peter and Julie Wright, Jovita da Silva, Jack Kros, Dr J J Brossy (back in 1977), Geoff Lockwood, Marais Malan, Gordon Vorster, Elize Jordan, Charles "Chuck" and Helen Redman, Stan Gordon of Sharp Edge Sharp Shooter, Patrick O'Leary, Alan Busuttel and Dave Marcus.

James Clarke

Johannesburg 1987.

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Chapter One

Survival equipment

"Be prepared."

Motto of the Boy Scouts

As a journalist I have for many years listened to the stories of men, and a few women, who have survived the most abominable hardships. People like the Royal Marine Commandos who recounted their stories just after World War 2; Chindits, Chetniks and Partisans; the shipwrecked and the shot-down, and closer to home, men who have wandered lost in the prickly environment of the African bush and a few who have even escaped the lion's mouth. And often I have wondered: would I have survived in such circumstances? Would I have landed myself in the same predicament given the options? Sometimes I have marvelled at how silly some people can be.

Then, one day in 1976 it happened to me. Having helped cut up a buffalo carcass, I found myself alone in the bush with the butchered carcass miles from any road and covered in gore. I watched the sun go down and the colour drain from the Transvaal lowveld landscape. A hyena yodeled in the near distance. Then I heard the deep booming of a lion. I had no gun, no knife and, on reflection, no brains. Oh yes, and no matches. My companion, who had gone off in the Landrover to look for a vehicle which was supposed to have been following us, had obviously forgotten where he had left me.

Should I climb a tree? I recalled Kruger Park warden James Stevenson-Hamilton (who knew these parts so well) saying it was impossible to sit up a tree for long – rather sleep under it, he decided, and risk being eaten. Should I stand in the open? No, rather put my back to a tree and then I need only look to the front and sides. Should I rub two sticks together and start a fire? I didn't feel too confident about that.

Should I write something immortal to be discovered on my body? No pen. No light by now either. Start walking, I told myself. Sing loudly. Don't run. The camp was three hours walk away and in an hour or so the stars of the Southern Cross formation would be visible and I would then get an accurate fix.

Before the Southern Cross rose I saw, with a mixture of relief (mostly) and a little disappointment, headlights coming towards me ... I have often debated in my mind what I would have done had my companion not found me.

This book then is about all the precautions you should take to ensure that when you venture into the bush, the mountains, the desert, or along a wild coast you don't waste the return half of your ticket.

Safety really begins at home when you are planning a trip. That's the best time to think; to brainstorm all the possible eventualities and to run over the checklist with your companions. I am talking not only about taking those extra batteries or the snake bite kit but about packing a few comforts too. About how to ensure not just your survival but your comfort. A friend of mine said that his two-week long 280km Transkei Wild Coast trail was marred only by his not being able to scrub his nails! So he now includes a small nail brush in his kit. Some people, of course, might be miserable without cake forks. I intend to be more basic.

The survival knife

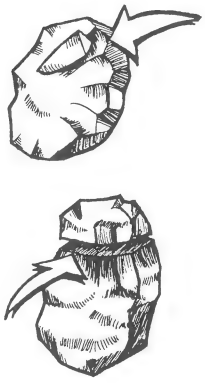
The first implement man ever fashioned, apart from a wooden or bone club, was probably a hand axe, the precursor of today's "survival knife". And for one million of *Homo's* two million years on Earth the hand axe was his principal tool. It was this survival tool that enabled man – naked, clawless, without fighting teeth and lacking fleetness of foot – to survive on the African plains in competition with the great predators.

Although highly unlikely, in extreme circumstances you may just need to make a stone tool, the simplest being a "pebble tool" cleaver with one sharp edge. Here is how you do it. Get two rounded stones and simply bash them together or throw one stone against a larger one. One will break in half providing you with a useful sharp edge and, with luck, a comfortable rounded grip.

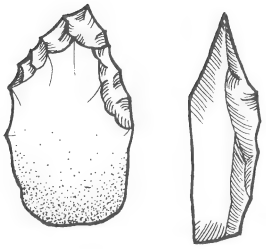
A shaped hand axe requires much more skill. Fortunately, much of southern Africa abounds with suitable material for making Stone Age tools.

A useful little "blade" can be made by striking a stone a glancing blow against another so as to cause a flake to shear off. The flake becomes a knife which can be used to skin an animal or even be further shaped by skilful chipping into an arrow head.

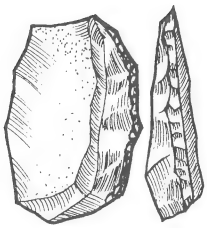
It's not easy. You have no real control over the lines of fracture. The South African veld is littered with evidence of Stone Age tools which



Stone tools



Hand axe

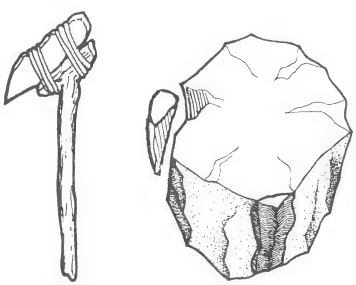


Stone age knife

broke before a useful edge had been completed. But by studying the illustrations you will get the idea.

Around the beginning of the century, the great survival knife of South Africa was the London-made "Bushman's Friend". This was the wooden-handled knife with which Kruger park pioneer game-ranger Harry Wolhuter, in August 1903, stabbed a lion to death as it dragged him off in the night after having caused him to be thrown from his horse. Fifty three years later Wolhuter told me how, while convalescing, he had gone to England and met the manufacturer who presented him with the "grand-daddy of the Swiss Army knife" complete with toothpick, button hook, tweezers and a tiny folding ruler!

One of South Africa's top authorities on knives and survival equipment generally, Stan Gordon, considers the Swiss Army Officer's knife - the genuine ones with Victorinox engraved on the shank of the blade - as the most useful knife for the ordinary backpacker.



But first let's look at conventional survival knives.

The fixed blade knife

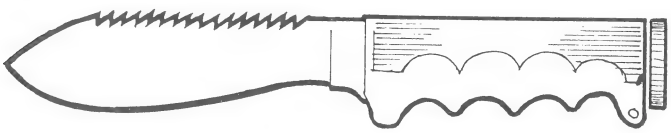
Many outdoor men such as hunters, explorers and field workers prefer a fixed blade knife.

Choose a well-known brand and weigh the knife's characteristics against your needs. For instance, the Bowie knife looks most impressive and is strong and big enough to fell a tree but it would be, to my mind, an enormous encumbrance to carry. True, you can throw it and even kill

a buck with it but if you haven't mastered this art, forget it! In any event, the latest survival knives have hollow tubular handles into which you can ram a straight stick giving you something far more practical to hunt with — a spear.

Taking everything into consideration the ideal survival knife should have the following:

BLADE: about 150mm (6 inches) long, about 35mm (1,5 inches) wide and 6mm (say quarter inch) thick. Its most important aspect — *it must be of high quality stainless steel* which can "hold an edge" and be sharpened quickly under field conditions. A useful model for a survival knife has a cross-cut saw along the spine (the back edge) as well as a razor sharp edge. The saw could cut through a tree as thick as your wrist with ease.



Ideal survival knife

The blade must be well attached to the handle. If you choose a hollow-handled knife then unscrew the cap on top of the butt (at the end of the handle) and look down it. Some blades are fixed to the handle by a nut and obviously this type of knife would have much less strength at the join than a working knife whose blade runs the full length of the handle.

Should the cladding of the latter knife break, at least you can then bind some cloth around the tang.

Is the saw really necessary? If you have it you'll use it. But certainly it can be useful for clearing a landing strip, building a strong lean-to shelter, or making a stretcher. It would undoubtedly be more useful than a simple blade when it comes to cutting poles.

A really strong blade has more uses than just cutting: J.E. Smith ("Survival Knives and Survival" published by EPJ & H Enterprises, Inc. 121 East Main Street, Statesboro, Georgia 30458) showed that by driving a working knife 50mm into a tree trunk (by pounding it with a heavy stick) one can stand on it and scale a perhaps otherwise unclimbable tree to get at edibles such as fruit and birds eggs.

Obviously the blade of a working knife must not be brittle. If a good knife blade becomes bent and has to be straightened it should still hold its edge.

HANDLE OR BUTT: This should ideally be hollow with a watertight screw-off cap. It is amazing what you can fit into a 150mm (6 inch) hollow handle: you can store matches, needles and thread, fishing line, hooks, sharpening stone and so on. The ideal knife has prominent finger grooves to give a firmer grip but J.E. Smith prefers a knife with just one small indentation for the index finger and a slight bulge for clenching the fist around.

It obviously depends on one's personal preference. Take your time in choosing a knife.

Never go for a wooden-handled survival knife. Wood warps and cracks if used in water. Avoid a metal handle too because metal becomes uncomfortable during long periods of work. The ideal knife has a handle made of a material which I can best describe as compressed polymer "rubber" with a non-slip finish. *A non-slip finish is vital in wet conditions.*

Another absolute must is a strong eyelet at the end of the handle for a lanyard. This will ensure you don't lose the knife while, for instance, working over water or on a mountain side.

In a recent book (The SAS Survival Book by John Wiseman and published by Collins Harville) the author was not particularly impressed by hollow-handled knives. His concern was first the possibility of a hollow handle breaking and second, if you were to keep your survival kit in the handle and you lost your knife, you'd then lose everything. These are important considerations. But under Southern African conditions the ability for a hollow-handled knife to be turned into a heavy duty hunting spear by pushing a straight stick into the handle is an important consideration. Personally I like the idea of a hollow handle.

The screw cap (check that it has a rubber washer) in one knife I handled had a mirror-finish underneath so it could be used as a mirror to flash signals. Another had a compass but that immediately precludes you from using the butt as a hammer. In any event, even chopping or sawing would soon put paid to an instrument as delicate as a compass.

The guard (or hilt) must be adequate and comfortable. Its function is simply to stop your hand sliding down the blade and also to help with leverage.

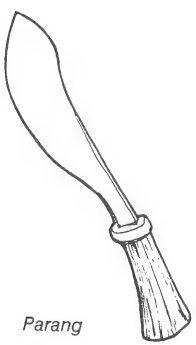
SHEATH: The ideal survival knife should have a nylon webbing (Cordura) sheath with a metal back plate lying against the body. The metal plate has a two-fold purpose: it acts as a signalling mirror and it prevents the wearer from being stabbed by his own knife should he fall against it. *The sheath should be so designed that the knife cannot accidentally fall* out even if you should be hanging upside down. You can buy various types of sheaths, some with pouches for carrying sharpening stones and for additional survival equipment.

Although these heavy-duty fixed blade knives are obviously designed for men, there are lighter, short-handled sheath knives for women. One is about 250mm (10 inches) of which 125mm (5 inches) is blade. The hollow handle of light alloy is rounded and wrapped with cord.

Test all hollow-handled knives for leaks by immersing in a bucket of water.

CHOPPERS AND PANGAS: Col. D.H. Grainger (of the former Rhodesia Army) in his classic little book "Don't Die in the Bundu", recommends carrying a panga because it can be used as an axe, a knife, a spade and a weapon. This recommendation is echoed in "The SAS Survival Handbook" which also recommends a kind of panga – or rather the more sophisticated Eastern version called a parang which is somewhat shorter.

The parang's blade, 300mm (12 inches) long, is curved in such a way that when chopping down a tree the middle of the blade strikes the trunk before your knuckles do. The pointed end of the blade is used for skinning and the edge nearest the handle for carving. Certainly a panga or a parang is useful in one's bush vehicle kit but it is not very practical to carry around when on foot.



Parang

What about an axe? Really good stainless steel "choppers" are so expensive (as much as R300), and so limited in their uses, that it seems wiser to go for a panga or parang.

CARE OF KNIFE: Generally speaking this is common sense. Don't throw it and avoid using it for purposes other than those for which it was designed. Don't store blades which have a high carbon content in leather sheaths as the tannic acid reacts with the metal and spoils the edge. *Always keep your knife sharp – the sharper it is the safer* because it will cut without great pressure being applied. This lessens the likelihood of the knife slipping and you ending up with your fingers in the food.

In the field you can sharpen a good knife on any smooth-grained sandstone, quartz or ceramic but rather carry your own small whetstone, rough on one side (to get out the nicks in the blade) and smooth on the other for final honing. You can also hone a knife on horn or hoof or metal.

Always draw the knife along the stone at a shallow angle (laying it almost flat) and in one direction when sharpening.

ALL PURPOSE KNIFE: *The Swiss Army Officer's knife is the most useful for the backpacker.* A recent model (Swiss Champ 1:67,95) is about as wide and deep as a packet of 20 cigarettes and has 29 features including two knife blades, screwdrivers (including Phillips), wood saw, fish scaler, ruler, rasp, tweezers, pliers, scissors, wire cutter and so on.

It has an optional leather sheath with several compartments containing an "SOS Set" which is in fact a survival kit including a Swiss compass and a ruler for map reading, sharpening stone, ball point pen, writing paper, 3 Band Aids, 2 safety pins, thread, needles, 5 matches and a nylon cord. There is a lesser Swiss Army knife — (The Explorer 1:67,03) which has nine bare essentials.

Survival kit

Having analyzed several survival kit inventories from "Don't Die in the Bundu" (Published by Howard Timmins) to the very latest "How to Survive on Land and Sea" by Craighead et al (published by Airlife) my list of contents for an *absolute minimal survival kit* is:

- Full 2 litre water bottle
- Fixed blade knife
- Large sheet of transparent plastic
- Lighter (and or matches)

Remember that your basic needs are water, food, shelter and fire. Under South African conditions, water would come first!

Here is a more *comprehensive* but still very portable survival kit which, technically, could sustain you for months on end.

- 2 litre plastic water bottle
- Fixed blade knife and Swiss Army knife (preferably with built-in pliers for making wire snares).
- At least 12 sheets of transparent plastic 1m x 1m (3ft x 3ft) for collecting water, and six transparent plastic bags.
- 1m plastic tube for use in solar stills and at small water holes.
- First-aid kit (see details outlined under 'Medical Kit').

- Two cigarette lighters. You can buy small lightweight ones, or wrap non-safety matches in waterproof material. Make sure they are "strike anywhere" matches and are replaced by fresh ones every trip.
- Compass.
- Map and Betalight (an expensive but almost everlasting coin-sized light-emitter for map reading).
- Small magnifying glass for starting fires in daylight.
- Water purification tablets or aqueous iodine (see water).
- 3m wire for snares.
- Fishing line, 10 small fish hooks and three small sinkers.
- Solid fuel tablets.
- Small aluminium cooking pot (mess tin).
- Needles (2 big, 2 small) and thread.
- Whistle.
- Torch - batteryless.
- Flares (3) hand held (see later in this chapter).
- Mirror for signalling.
- Catapult (and marbles for ammunition if you have the space).
- Emergency rations: I would include a small bag of tea (not coffee as it makes you thirsty) and whatever dehydrated food you need. Meat cubes are sustaining. Glucose tablets are a must.
- Where hypothermia is a possibility take a "survival bag" preferably of reflective material 2m long and 0,75cm wide. You get inside it to escape the cold. It takes up almost no space and weighs almost nothing. Even a body-sized polythene bag will do.
- Separated sheets of toilet paper.
- A flexible saw can be useful and takes up little room. It is as thick as a cord and can cut down a sizeable tree.
- Notepaper and pencil.

- 3 medium safety pins.

MEDICAL KIT

- Snake bite kit (with pressure bandage added).
- Sealed sterile gauze dressing (3).
- 1 roll 50mm bandage.
- 1 triangular bandage.
- 6 small, 6 large Band Aids.
- 1 large and 1 small scalpel.
- butterfly sutures (for holding a wound closed).
- tweezers.
- An illustration of pressure points on the human body plus others showing how to arrange splints, revive unconscious people and so on.
- Codeine phosphates (for aches and pains).
- Antiseptic cream — Bruladine is ideal.
- Aqueous iodine (for purifying water).
- Sunburn cream. Anthical is usually recommended.
- Small bottle of alcohol.
- Anti-diarrhoea and laxative pills.
- Anti-malaria tablets.
- Tetracycline tablets (antibiotic which is safe to use on people who are hypersensitive to penicillin). Take enough for a complete 7-day course of 250mg tablets four times a day.
- Potassium permanganate — this will sterilize water (it turns bright pink but is safe to drink) and, in heavy dose (water bright red) it is a good antiseptic and anti-fungicide. NB: Potassium permanganate is useless against snake bite and out-dated advice contained in some books must be disregarded. See under SNAKE BITE.
- Antihistamine tablets (for bee stings and insect bites. It can also be used as a mild sleep-inducer).

Survival clothes

Tent
Hat, a sensible precaution
Keep map, compass, permits, papers, and opticals in this section
Clothes and lighter gear
Cooking materials such as fuel and stove, tin opener etc.
Water bottle, mug, spoon and snacks
Snake kit, first aid, pocket knife, torch, candles, lighter, toilet paper
Toilet requirements
Sleeping bag, foam matress, air pillow
If wearing shorts, high boots are advisable for protection

Ideally your backpack should not exceed a quarter of your body weight. Heavier things go towards the top. Side pockets must be balanced in weight.

In South Africa it is always advisable to wear a hat – to guard against heat stroke – and sunglasses – to guard against glare – when walking in the desert or at the coast.

It is fool-hardy to start a serious expedition which entails long trails on foot in new boots. Boots, with ankle supports but not too high, are preferable to shoes. Boots which are well broken-in and pliable are your best protection against serious blisters which can eventually cripple you for two or three days and hold up your companions. Take at least two pairs of socks.

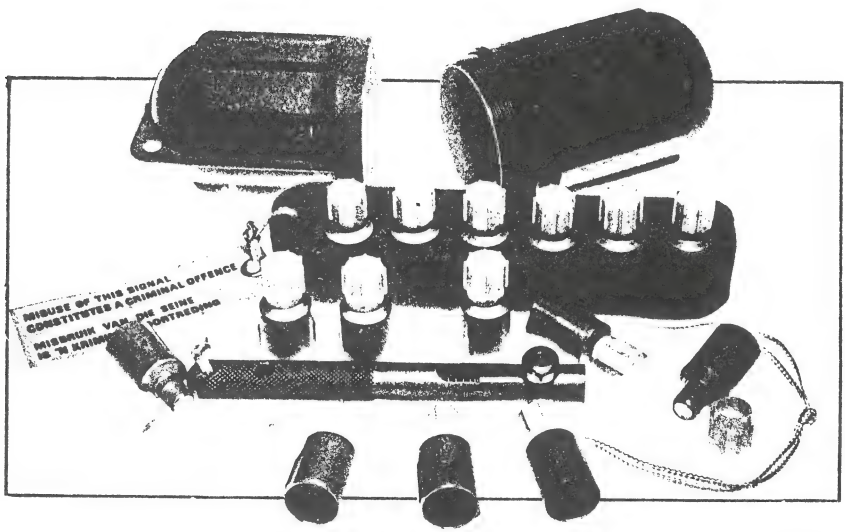
You can harden your feet, incidentally, with surgical spirits. This prevents blisters.

A light-weight water-proof poncho is a good idea – even in the desert where the nights can be freezing. Ponchos can also be useful for collecting water (see WATER). Naked Namibian Bushmen nomads on really cold nights sit with their knees drawn up and a poncho-like skin cloak draped over their shoulders but held away from the torso. The temperature of the air sandwiched between skin and poncho has been found to be precisely that of an intensive care unit. You would neither gain nor lose body temperature.

Lights first time

... every time

"...but, no-one hears your cry."



At the most unexpected moment, anything can happen, a sudden fall, a broken limb, and no-one hears your call. A little insurance is always needed. Next time you go, take your own protection. Our pencil flare kit is compact, waterproof and ideal for you.

The pencil flare kit consists of 6 flares, a launcher, and a hard-walled outer container. Each flare is shot to a height of at least 75 metres, burning with a bright red light which is easily observed in day and at night.

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Chapter Two

Surviving

"Some of our hurts you have cured,
And the sharpest you still have survived,
But what torments of grief you endured
From evils which never arrived!"

Ralph Waldo Emerson

The intelligent well-prepared person is unlikely to run into a life-or-death emergency in the bush. Equally, he or she is not going to bank on that.

I recall a highly competent mountaineer – a member of Pretoria University's Exploratia Club – who climbed the Natal Drakensberg escarpment some years back having decided that an incipient head cold he had felt coming on was of little importance. Two days later, beset by a blinding mist, he was dying of pneumonia in the un-compromising atmosphere at 3 000 metres. A companion risked his life by racing down the mountain to find help. The sick man was rescued in the nick of time by an Airforce helicopter. Some have not been so fortunate. A few people, very few, have died of thirst in the wilderness and a few from the action of wild animals including snakes. But many have perished from exposure.

In South Africa it is difficult to wander further than 10km from a vehicle track. True, there are some very lonely, rarely-used vehicle tracks! In neighbouring territories the bush is considerably wilder – Namibia, Zimbabwe, Botswana and Mozambique have some of the world's loneliest wildernesses. South Africa itself chalks up only a very small toll of people who die in the wilds.

You have to understand that the African bush is neutral. Nature has no hard and fast feelings about your survival. As John Burroughs said of the American wilds: "Nature does not care whether the hunter slays the beast or the beast the hunter. She will make good compost of them both and her ends are prospered whichever succeeds".

This book's intention is to give you slightly more than a sporting chance. *But remember, survival, like charity, begins at home, and preparation is half the battle.*

MORALE — the reason dawn man survived his African genesis in a veld picked over by large predators is not because he was a "born killer" but because he could co-operate with his fellows in a highly intelligent and effective manner. When it comes to the survival of a group of people stranded in the African wilderness, co-operation is vital. So is cheerfulness. So is resourcefulness. But co-operation comes first.

Preparation

Before you set out to some remote or potentially hazardous region, sit down with your travelling companions and write an inventory of all that you will probably need. This advice is a bit like teaching granny to suck eggs and I apologize for it — but THEN you debate what could be (as they say in the nuclear industry) a "worst case disaster". THAT's the one you now have to prepare for. Ask yourself: *If the worst happens will I have the equipment to cope*?

For Drakensberg climbers, that "worst case disaster" might be being trapped on top of the 'Berg by a three-day blizzard. For the Kalahari wanderer it might be a vehicle break-down miles from the nearest water. Incidentally it would be foolhardy, to say the least, to go into the deep Kalahari in one vehicle unless you took the precautions of carrying a two-way radio and leaving a copy of your itinerary with a friend and, if possible, with the local police. The same goes for those climbing in the 'Berg. When you sign in at the hotel or at the Department of Forestry's hut, state your goal and your route in the register which is provided, and stick to that plan.

Most potentially hazardous expeditions require a fair amount of physical fitness, so train before you go. It makes sense to start a fitness (exercise) programme at least a month beforehand. And when you train, don't forget to do so in the boots or shoes you will be wearing when away. *Never set out in boots which have not been broken in*.

You can expect to cover 20km a day walking leisurely in the bushveld and up to 40km if you are fairly fit and in a hurry.

Depending on where you are going, check if you need cholera, vaccinations or typhoid injections. And don't rely on guesswork. Jaynee Levy ("Trailing and Mountaineering in South Africa") says that a woman on the Otter Trail in the Outeniqua Mountains in the Cape contracted typhoid in 1981. Nobody is going to advocate typhoid injections for holidays in the Cape of course but the experience does underline the need to *boil all water from rivers no matter where*. You can, incidentally, buy a small eminently portable water filter which will remove most common

"bugs" including *Salmonella typhosa* the bacterium which causes typhoid.

MALARIA: if you are bound for areas north or east of the Highveld plateau, take malaria pills. These are obtainable from any chemist. Take the recommended dose a day or so before setting out and continue to take them weekly until you have been back for a month. (See under HEALTH).

Consult your doctor about anti-tetanus injections. These are essential if you are expecting to be in a poorly serviced or inaccessible area.

Get your TEETH checked. There's nothing more aggravating than having toothache in the bush and it is also unfair on your companions.

It obviously pays to research the area you're visiting. Read up on its climate, its people, their major taboos; what the vegetation is and the animal life and the general land form.

The moon phases during your stay can also be useful to know.

For much of Southern Africa I:50 000 maps are available.

If you are going in a group then allocate tasks to each individual. One could be responsible for the food, another for the vehicle, and a third coul be designated your general guide — the last named should learn a few useful words in the local language so that contacts with local people are as amicable as possible. The vehicle man would be responsible for getting, checking and stowing spare parts. Somebody should also specialise in the medical side and ensure the medical kit is complete. There would be some logic in getting this same person to research probable water availability in the region and what capacity containers might be needed and to check on clothing needs. The bushveld, like the desert in Southern Africa, can be hot in the daytime and miserably cold at night and this is the sort of information he should dig out.

One more basic thing — on *any long overland journey in an inhospitable region take three days extra food with you.* If you don't get into difficulties you can always celebrate with a grand finale camp banquet!

"A primeval land, untouched by man..."

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Chapter Three

Water

"Water, water everywhere
Nor any drop to drink."

Samuel Taylor Coleridge

Your body is 75 percent water and it needs continuous topping up. That requires a minimum of 1 litre of water a day – assuming you are inactive and keep cool – but on a hot active day you will need 4 litres if you want to feel good. You need water mainly to ensure the kidneys have enough passing through to eliminate wastes from your body. However, like a motorcar, your body also overheats and it needs water to get rid of this through perspiration. In a true desert environment (the Namib let's say) 2 litres a day would keep you alive three days. That's all.

Even partial dehydration results in a falling off of efficiency, both mental and physical. *Ideally, when walking in Southern Africa's relatively hot, dry conditions, one needs 4 litres a day.*

Here are some useful rules for operating in arid territory:

(1) *As soon as you realise you might be running low on water, look for it. Don't risk running out.*

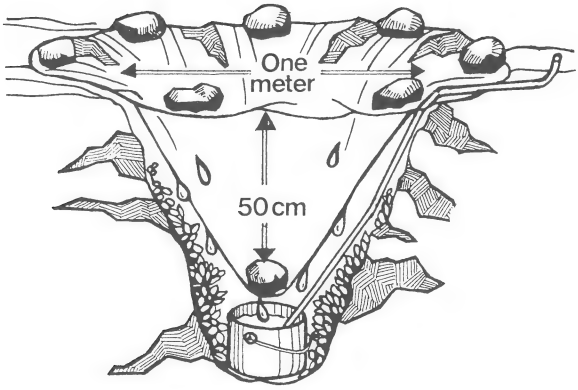
(2) Rest in the shade as much as possible. Rest is essential: with normal activity you lose 2-3 litres a day, but with rest you can get this down to one.

(3) If you are in an arid area with no shade, scrape out a depression, stack your gear on the sunny side and rest in whatever shadow you can create.

(4) Move only when it is cool.

(5) Breathe through your nose, you lose less fluid that way. Talk only when necessary. That also conserves water. Don't remove your clothes – you'll dehydrate faster.

(6) Eat as little as possible. Digestion uses up moisture from vital organs – especially after eating fatty foods. Alcohol also uses up moisture, as does smoking.



(7) Don't try drinking urine or sea-water — but they are fine if distilled. (See solar still).

(8) When eventually you find water take it easy; don't gulp it down. You are likely to vomit and thus lose more water.

(9) A pebble placed under the tongue is said to take your mind off thirst. Col. Grainger ("Don't Die in the Bundu") recommends chewing a piece of bark or mopane leaf.

(10) Grainger says that once you realise you are lost then try to go without water for 24 hours, gargle during the day and drink sparingly at sunset. I would argue that it would be a mistake to go thirsty on the first day as it would certainly lower your efficiency at a crucial time. It is a matter for debate. But don't overdo the thrift part. People have died of dehydration with water still in their bottles. Alonzo Pond, an expert on desert survival, says "drink as you become thirsty so that you can remain clear-headed during the first day when important decisions have to be made".

FINDING WATER: In any terrain, walk downhill and try gauge the lowest drainage point on the landscape. If this brings you to a dry stream bed push a stick into it. If it glistens when you withdraw it you are in luck. Now dig! Even in some quite dry-looking Namib stream beds water can be found only 1m (3ft) down. If a rock bar lies across a bed, look for water on the upstream side.

Scoop a hole as deep as possible. After a time the hole should accumulate water. Dig for water where the river sand is up against a cliff or

outcrop (especially where plant life is thriving) because that's the most likely place to find moisture.

Away from a stream bed look along the edge of cliffs and outcrops of rock even on raised land. In escarpments look for it on the gentler slopes behind the escarpment and follow gullies upwards. In Africa the water which causes dongas (gullies) often runs for the first few centimetres of the donga for days and weeks after rain.

DESERT SURVIVAL – in the hot dry air of the central Namib a fit man could survive 3 days without water – if he stayed still and had shelter from the sun. "A litre of water a day", says Alonzo Pond, "will not significantly extend this survival time". A fit man could walk (at night only) a maximum of 50 kilometres in 2 days but on the third day he would be in extremis.

Gravel in a stream bed is a promising sign that water is not far below.

Along the coast look on the shady side of sand-dunes just above the high tide mark for that is where you can find fresh or brackish (but drinkable) water. It floats on top of the denser sea water which ebbs and flows beneath the sand.

Mud placed in a cloth (a shirt say) and then wrung out will produce water.

A rudimentary knowledge of birds will help you find water. The double-banded sandgrouse in the desert is an excellent indication. At dusk they fly fast and low – straight for open water. The Namaqua sandgrouse drinks within the first three hours after sunrise. In fact, any seed-eaters – pigeons, doves and so on – will head for water for they all need copious drinking water. In the late afternoon they fly straight and fast to places where there is open water. *It is useful to know that doves and pigeons fly in ones and twos to water but return in flocks*.

On the other hand "water birds" such as herons and waders and even kingfishers are not much help because they move far from water. In fact five of South Africa's kingfishers don't fish at all.

Birds of prey – except for the fish eagle – are also of little help. They derive moisture from their prey. Vultures enjoy regular bathing – and if they don't lead you to water, they will at least lead you to meat. Guinea fowl are not good indicators but when they do drink open water they do so at dusk. Ducks and geese fly to water in the early morning and return at dusk.

The presence of wildlife helps. By following the spoor of animals downhill one can find water. However, if you're in the Kalahari and Namib

deserts remember that a lot of animals almost never drink at open water holes and thus exist long distances from water. Lion and their prey can go weeks without drinking at open water.

When following spoor note the direction in which trails merge – they point to water like arrow marks.

Bees are an excellent indication that water is within 6km and usually much less. Study their line of flight. Green iridescent flies also never move far from water.

As far as wild animals as indicators of water are concerned – giraffe, springbok, duiker, squirrels, mongooses – they are all pretty hopeless. Kudu usually seek water in the afternoon but to be frank, unless you see hippo with wet feet or crocodiles, otters or walking catfish forget it. It does pay though to follow well-trodden game tracks downhill.

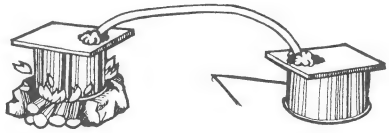
Once you have successfully dug for water, if you have no means of ladling it out you can use a reed as a straw. This is where a plastic tube is useful in a survival kit. Reeds are not hollow all the way down but the blockages at the joints can be pierced by using a finer reed or wire. If seepage is slow, stuff a bundle of grass into the base of the hole, place a couple of hollowed-out reeds into it and suck through these straws. The grass bundle becomes a sieve. Col. Grainger recommends spitting what water you get into a tin and collecting it.

An effective way to collect water is to soak up dew at dawn with a cloth or tying your clothes around your ankles and walking in dew-covered grass or other vegetation. Your clothes will soak up the water which can then be wrung into a container or straight into your mouth. You can wring out 2 litres an hour this way.

If you come across a scum-covered pool try to find a straw (or use a plastic tube) and pierce the top layer to drink the fresher water below. This is also a way to avoid your skin coming into contact with bilharzia-infested water. (see under HEALTH).

If a pool is really filthy then dig a hole next to it and allow water to seep in. If you let muddy water stand for a while it will settle out leaving clear water on top.

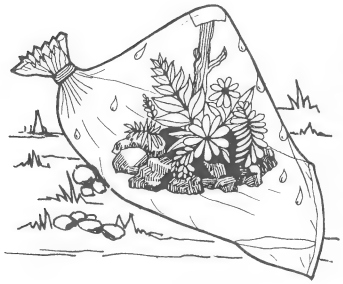
Distilling impure liquids including urine - place liquid in left receptacle. Steam passes along plastic tube to condense as distilled water. Mud plugs gaps.



One can get water from the stomach contents of a buck by straining it through your clothes into a container. You could use the creature's skin as a receptacle by lining a hollow with it. Inside animals' eyeballs, in the eyes of fish and along the spine of fish you will find drinkable water. (Avoid drinking blood or other fluids because the protein in them will need more moisture to digest than you can possibly take in).

Col. Grainger says you can clarify the liquid from a buck's stomach (after straining it) by adding "a small piece of liver".

There are various ways of producing water by condensation. Remember that a fair amount can be licked off cool surfaces (the windows of a vehicle, metal fuselage and so on). If you're out there on your own with nothing to lick, try piling stones in a sheet of plastic lining a shallow depression. Moisture in the night air condenses on the stones and drops into the plastic sheets to give you a small puddle of water. This, of course, is where plastic sheeting and polythene bags are so essential in a survival kit. They take up so little room and are practically weightless.

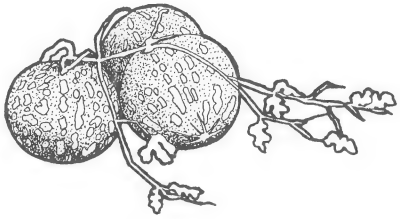


Water from plants

One can produce water from plants by making a hole in the bottom of a plastic bag and placing it over a green plant. Push the corners of the bag into the ground to form a gutter around the plant. Tie the top. Transpired moisture from the leaves and from the soil will form droplets inside the bag and run off into the gutters. Drink through a reed straw or plastic tube if possible. To produce more moisture one can add fresh picked leaves from other plants.

Aloes and other succulent plants contain drinkable amounts of moisture. *If the sap tastes bitter assume it is poisonous. Avoid all plants with a milk-like sap – they are most certainly poisonous.*

Take a lesson from the Kung San Bushman: they derive a great deal of their moisture from the desert melon, *Citrullus lanatus* (tsama – it is in fact the same species as the water melon and looks exactly like a round water melon) by

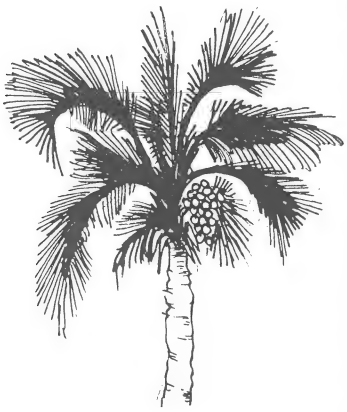


Tsama

placing the pulp in the palm of the hand, making a fist and squeezing it. The juice is trained down the thumb into the mouth. If they were to chew the pulp and then spit it out they would waste moisture.

In the Kalahari the most important source of water is plants.

Palm trees can be useful reservoirs. The banana palm can be sawn off at the base – just 70-80mm from the stump – and a bowl-like hollow carved out of the stump. This will fill up with water. Scoop out the first three fillings (they taste bitter) and all that flows in afterwards will be drinkable. The moisture will continue to accumulate for three or four days.

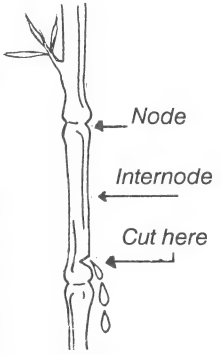


Ilala palm

It might be useful to know that the ilala palm (*Hyphaene natalensis*) which is found down the African seaboard and quite deep into Natal including much of Zululand and along the Limpopo is a rich source of moisture. Its copious sap tastes a little like ginger beer ("Trees of Southern Africa" by Eve Palmer) and possibly has nutritional value as well. A similar species, *H. ventricosa*, or the fan palm, grows in the dry west (Botswana, Namibia and up into Angola). The stems of these trees (after chopping the top off) will exude dozens of litres of water. One cuts the top as if sharpening a giant pencil. An average tree yields 70 litres (15 gallons) according to local people who sometimes actually own individual trees – so beware!

The ilala palm and the more common phoenix palm indicate fresh water 1m (3ft) below the surface.

Forest vines can provide prolific water, the lianas in particular. (Avoid all which have milky sap). The water travelling along a vine (it is *en route* to the leaves where it is transpired) flows more strongly during the heat of the day. To get water from a vine cut a deep notch in it as high as you can and then sever it 0.5m (18 inches) from the ground. The notch will check the water being drawn upwards. Water will flow down and from a



Bamboo

WATER TREE – one can sometimes find large amounts of water in the tops of baobab trees at the point from where the branches radiate.

couple of metres (6ft) of liana you should get up to a litre (2pts). A dozen lengths standing on end in a pot will drain quite rapidly. When the water ceases to flow cut 30cm (1ft) off the top and the flow resumes. Repeat this until the flow ceases. An excellent book regarding such survival techniques (not specifically in Africa) is "How to Survive on Land and Sea" by Frank C. Craighead *et al* (Airlife) which was published in 1943 and put out in a revised edition in 1987. Craighead advises that in cutting vines it is important to make the top cut first otherwise capillary action will cause the water to be "sucked" upwards from the length you are cutting.

Thick lengths of bamboo contain fair quantities of water trapped above the nodes. You can (with a strong enough knife) cut into the base of each succeeding internode and let the moisture drip into a container.

Several species of plants – such as aloes – whose leaves form a funnel, usually contain trapped rainwater. You may also find an accumulation of dead insects inside. Consider them a protein bonus but the finnicky might prefer to find a straw and suck the water out without disturbing the insects.

Grainger makes the point that "it is well to remember that no fruit will alleviate a serious thirst".

RAIN: if it rains, don't waste time. Collect all you can. Make hollows in the ground and line them with anything you can find; even with tree bark if you have nothing else. Stamp the earth down hard. You can use your poncho, plastic bags or your tent to line reservoirs.

You can expect rain within a day or two of cirrus clouds forming. These are thin, whispy fibres of clouds at 6 000 to 12 000m (20-40 000ft). They sometimes indicate the presence of a distant storm. A halo around the moon (ice crystals of cirro-stratus clouds) can indicate rain within 16 to 24 hours. Afternoon cumulus clouds which rise from a base of 2 500m (8 000ft) to over 12 000m (4 000ft) indicate rain within an hour. The main thing is to have receptacles ready. Craighead says in this regard: "Be imaginative". He even suggests filling boots. Britain's elite Special Air Service force carry condoms for storing water. One will hold a litre (2 pints). The mind boggles how they manage to pour the water out.

You can also soak up water from rain-covered grass by tying your clothes around your ankles and walking in it – then wring them into receptacles.

SOLAR STILL: Dig a hole 1m across and half as deep (at least 3ft wide, 18 inches deep). Place a receptacle at the bottom and cover the hole with transparent plastic. Hold the plastic down with stones. Put a pebble on the plastic to make it sag. Moisture from the soil, and from any moist plant material you can mash up in the hole (slice up aloe leaves) will evaporate and condense on the underside of the plastic and drip into the receptacle. In warm weather it should produce about 0,5 litres (1pt) a day. *In this way you can convert urine and sea-water into drinkable water by moistening the sand inside the still and allowing it to distill.* The less smooth the underside of the plastic the better droplets will run down to the centre. If you can build in a syphon to tap the water from the receptacle without having to disturb the still each time, then even better. Another way is to drink it through a reed straw or plastic tube. Be warned, in the desert you can, if you are not careful, lose more body moisture digging a still than it can replace.

WARNING: *be careful about water purity anywhere in southern Africa — especially near villages.* Whenever you can, boil water for five minutes and certainly not less than for one minute. Boiling will kill the bilharzia fluke (cause of schistosomiasis) and pathogens.

There is now a highly efficient Swiss cartridge filter (Filopur) on the market which will filter out bilharzia and micro-organisms including cholera and typhoid (*Salmonella*). The filter weighs about 450 grams and can filter 200-300ml of dirty water in one minute. There is an even lighter (200gram) "drip-filter", available by the same manufacturer. One can hang it on a tent pole or tree and let it drip all night. The water is demineralised enough to use in vehicle batteries. Note, incidentally, that sand does not filter out bilharzia flukes.

The most portable means of water purification is a small bottle of iodine solution (ask the chemist for the 2 percent aqueous solution). Three teaspoons of iodine or a full tablespoon (15ml) mixed with a litre of water and left to stand for half an hour will kill bacteria which cause enteritis. Many experienced travellers prefer aqueous iodine to chlorine tablets.

You can make a fairly efficient filter out of a nylon stocking — hang it up and place sand in the lower half, charcoal and or moss on top and sterilize the water afterwards with aqueous iodine.

FURTHER TIPS: You can conserve body moisture best by walking fully clothed. Bare skin causes a rapid loss of moisture. You will feel cooler wearing a cotton shirt than you will walking bare to the waist.

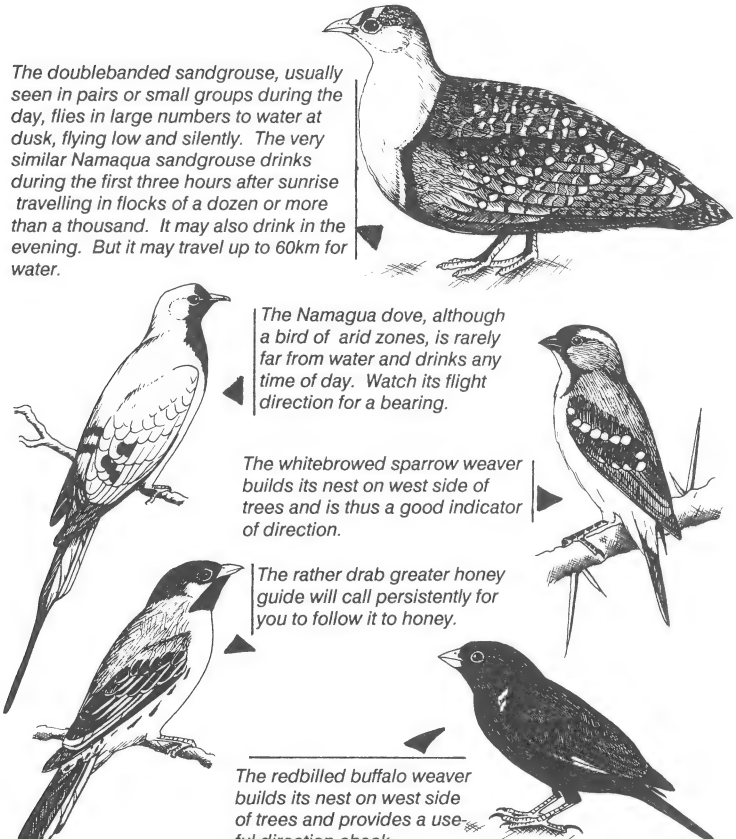
You can keep cooler by making yourself an Arab burnous. Place four or five layers of paper or cloth on top of your head, drape a cloth over it (or a t-shirt) and tie a string around the forehead to keep it in place.

STORAGE: A problem in transporting water on desert and bush expeditions is the amount of containers one needs and the room these consume in the vehicle. To save space, use silver foil-covered wine box bladders for extra water storage. Then, once clear of the desert, you can empty them.

Enough wine bladders to hold 100 litres can be packed into the space of a 5 litre can. When you need to fill them, you simply lift the valve off with a knife, fill and snap the valve back into place.

Blown-out ostrich eggs make useful water containers. Indeed that's how Bushmen store water. You can make 500mm long jars by cutting bamboo just below two successive nodes. You can even boil the water in such bamboo jars.

Birds as indicators


The doublebanded sandgrouse, usually seen in pairs or small groups during the day, flies in large numbers to water at dusk, flying low and silently. The very similar Namaqua sandgrouse drinks during the first three hours after sunrise travelling in flocks of a dozen or more than a thousand. It may also drink in the evening. But it may travel up to 60km for water.
The Namagua dove, although a bird of arid zones, is rarely far from water and drinks any time of day. Watch its flight direction for a bearing.
The whitebrowed sparrow weaver builds its nest on west side of trees and is thus a good indicator of direction.
The rather drab greater honey guide will call persistently for you to follow it to honey.
The redbilled buffalo weaver builds its nest on west side of trees and provides a useful direction check.

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Chapter Four

Food

"Never eat a toad".

Col. D.H. Grainger

For almost man's entire time on earth he has relied on hunting and gathering for his existence and a few peoples, notably the Kalahari Bushmen, still do. And it seems that hunter-gatherers rely mostly on a vegetarian diet. In fact they may not eat red meat for months on end. Red meat is, and always has been, a bonanza to primitive man. We can, without hardship live without it. At the same time, from a survival point of view, there is nothing to beat meat.

During a normal day's hiking you need a kilogram (2lb) of food, providing, that is, that your diet is sensibly planned. You can expect to burn up 33 000 kilojoules, or 8 000 calories.

The most useful food to take on an expedition where weight and bulk have to be minimal is freeze-dried food, but it is extremely expensive. In South Africa the imported US "Mountain House" brand, probably the most famous freeze-dried food in the world, cost about R7 in 1980 for a full 3-course meal for two. By 1987 it was R45 and more.

Freeze-dried food (a process unfortunately not carried out in Southern Africa) is food from which all moisture has been extracted. It retains its taste, much of its vitamins and other values as well as its cellular structure. By simply adding water it magically reconstitutes itself. A little brown flake blossoms into a cube of beef or a dry disc into an anchovy pizza; and all in a matter of seconds. But the more readily available locally-produced dehydrated foods do have their compensations: they have a longer storage life than freeze-dried food and while freeze-dried foods begin losing their nutritional value after 6 months, dehydrated food retains its food value for considerably longer. However, preparation takes longer for dehydrated food.

BLACKJACK SPINACH – (*Bidens pilosa*) is cooked in many areas. Young plants, lightly boiled are nutritious. Old plants are edible. Dry the leaves in the sun for later use. Amaranthus (pigweed) is a staple food in many areas and can also be dried.

Jaynee Levy, an experienced hiker in South Africa to where she has wandered far from her native New York State (via Alaska, South America and Asia), in her "Trailing and Mountaineering in Southern Africa" recommends the following high energy foods which are also easy to carry, easy to keep and quickly digestable: glucose tablets, nuts, dried fruit, chocolate, instant soup and "health bars" (eg: Noogy bars, PVM bars, Muesli bars) – and lots of tea. She decries coffee and alcohol saying they can, in excess, cause hypothermia and are useless for quenching a serious thirst.

Living off the veld

You can live for almost three weeks without food. Maybe even more. But in the southern African veld there's absolutely no need to. The veld's amazing variety of plantlife (South Africa alone has more plant species than the USA which is seven times bigger), and animal life, make it one big natural supermarket.

All grasses are edible, roots, stems, heads, the lot.

At some seasons you can gather the seed heads and thresh them, catching them in a cloth. You then blow away the chaff (husks). You can even thresh them in sand if you like and when you have blown away the chaff you simply pick up the seeds and the sand and dump them in water. The sand will sink, the seeds will float, and you can scoop them up. By pounding or milling the seeds with a stone or the butt end of your knife you have fresh flour.

Amaranthus hybridus

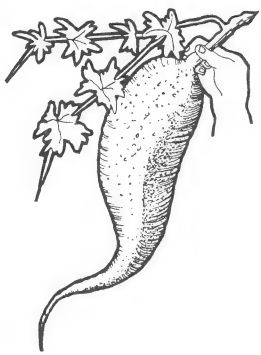
I cannot help but imagine this is all likely to consume more energy than you are going to get from the food but under certain circumstances it could be a proposition.

Around abandoned kraals look for sugar cane, sorghum, maize, sweet potatoes, bananas, spinaches and other domestic plants growing wild.

Amaranthus species (imbuya, theepe ea bokoni, pigweed, cockscomb and hanekam) make excellent spinaches. One can dry them by laying them out in the sun. You can cook them days later or boil them first and mould the soft green mush into small cakes and leave these to sun dry.

Amaranthus spinosis, a spiky plant which is also sometimes eaten as spinach is useful as a substitute for salt. The leaves and young shoots are used as a staple food (October to March) and are sometimes mixed with mealie meal to make a green porridge. The Zulu recognises 120 species of spinach.

The best reference book for those wishing to know more about natural veld food in Southern Africa is "Food from the Veld" by F.W. Fox and M.E. Norwood Young (Delta 1982 – and about to be republished). It describes hundreds of edible plants plus their medicinal uses.

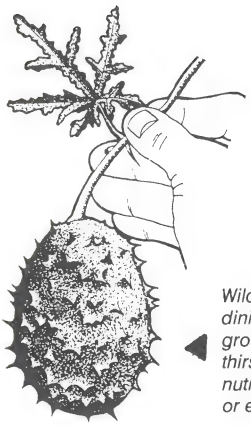


Coccinia rehmannii

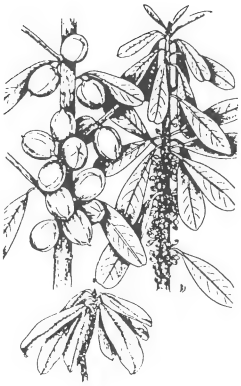
It is impossible to describe all the edible plants within the limited space of this book but I can offer some tips: for example, the common water lily has an edible bulb which is best eaten in early winter and can be eaten raw or boiled. A really first class meal can be had from one of the many "wild cucumbers" – particularly the species *Coccinia rehmannii* which has a tuber the size of a loaf and which is also a useful source of water. It also makes a delightful king-size roast potato. You sometimes have to dig it out of hard ground from nearly a metre down. It is found over most of the interior plateau and the dry west.

The roots and young fronds of ferns are edible. The bulbs of arid zone wild onions can be eaten raw or cooked and are a staple food in parts of Namaqualand.

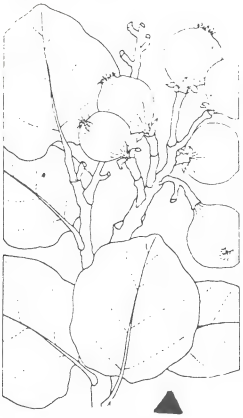
CURCUBITS – Africa, even in its seemingly most inhospitable places, has a variety of useful wild cucumber and melons. The common Herero cucumber, also called gemsbok komkommer of mokapana (*Acanthosicyos naudiniana*) with its green, spiky, egg-sized fruit is one third protein and full of moisture. Its skin, pulp and delicious seeds can be roasted, boiled or dried. The bitter lemon, bitter appel, khakha (Lovedu), ibece (Zulu), lehapu (Sotho), kgengwe (Tswana) - perhaps best known as the tsama watermelon - is similarly versatile and nutritious and widespread across the southern third of Africa. The Tswana dry slices on a frame ("lengangate") and the Pedi and Sotho cook the young leaves too.



Stamvrugte (B. magaliesmontanum). Widely distributed along rocky ridges. Fruits delicious and nutritious. (March – May).



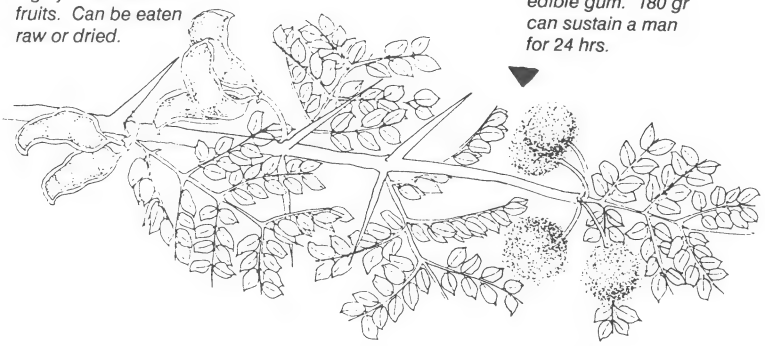
Wild cucumber (A. naudiniana). Common ground creeper: fruit is thirst-quenching and nutritious. Roast, boil or eat raw.



Figs (F. sycamorus). One of the edible and highly nutritious wild fruits. Can be eaten raw or dried.

Blackjack (B. spinosa). Leaves make nutritious spinach. Can be cooked with wild onions or dried and kept for months.

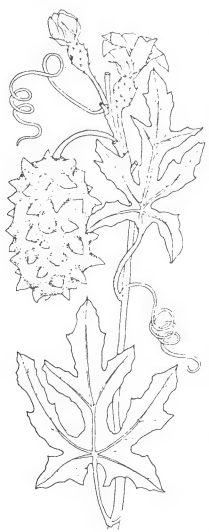
Acacia (A. karroo). Many species of acacia have tasty, edible gum. 180 gr can sustain a man for 24 hrs.



Courtesy: "Food from the Veld" by F.W. Fox and M.E. Norwood Young.

The roots and white base of the stem of the bullrush can be eaten raw or cooked.

There are, of course, hosts of trees, shrubs and smaller plants whose fruit is abundant and nutritious, depending on the time of year. There are many others whose roots can keep you going for days and I cannot emphasize enough the value of the late Dr. Fox's "Food from the Veld" when it comes to the distribution of each species and the way to recognise it. Fox describes a wondrous variety of wild potato, spinach, beans, "scrambled eggs" (*Plectranthus esculentus*), onions, cabbage, cucumber, melons, bread plants, coffees, teas, herbs and natural medicines. Even flowers can be food, some being sucked for their high calory nectar while others can be eaten like lettuce. There is nutrition in the flowers of aloes, *Gladiolus* species (raw or as a pot herb), hibiscus ... and many plants have nutritious leaves. *Oxalis* is one that is common and which can be eaten raw or cooked.



Cucumis metuliferus

But be warned: some plants can be extremely poisonous. Some fruits are poisonous when unripe.

Because of fatal toxins it is best to leave mushrooms alone entirely — unless you're an expert. It's hardly worth the risk anyway because there is so little nutrition in a mushroom. Apart from lethal types of mushrooms (just a small mouthful can kill you) you can test whether a plant is poisonous by first rubbing its leaves into the skin of your wrist. If irritation is felt discard it. Sniff it — if it smells of almonds discard it. Lick it — if you detect any unpleasant taste or sensation discard it. Now try nibbling a little piece. If it is bland or pleasant it is probably fine. You can wait five or six hours and if no effects then eat a spoonful. If there are no unpleasant effects after another eight hours try a handful. If you still feel fine after another eight hours pull up a chair, light the candles, and tuck in.

If you do eat a poisonous plant it can help to swallow a handful of charcoal scraped from the embers of a fire: drink it down with water.

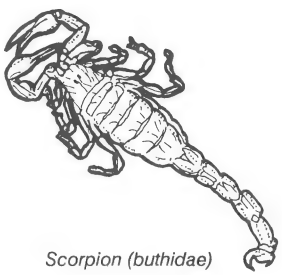
Grainger and Levy make the point that you can eat anything that you see monkeys and baboons eating (including, incidentally, scorpions — just remember to pull the sting out of the tail first). While the monkey-test is generally fine these creatures are able to eat at least one plant which is poisonous to man — the fruit of the *Capparis tomentosa*, a spiny lowveld shrub common in Zimbabwe and which, according to Grainger, occasionally grows around termite heaps on the highveld. The leaves of

this plant are alternate, have short stalks and are oval and smooth round the margins. The rounded fruit has a dark brown shell which is hard and about the size of a big walnut. The fruit can kill you but it does not affect monkeys and baboons.

There is also a species of wild cucumber (*Cucumis metuliferus*) which has poisonous strains but you can tell it by its very bitter taste.

Food from wild animals

In Southern Africa almost every animal you come across, every bird, all birds' eggs, all rodents and all reptiles and insects which scurry about the ground are edible.



Scorpion (buthidae)

INSECTS: are rich in fat. Flying ants (termites) can be trapped by placing a close tangle of twigs over the hole from where they are emerging from their nest. Beneath the tangle place a pot or saucepan. As the insects lose their loosely-hinged wings in the twig entanglement so they fall into the pot. Simmer over a fire and store till needed. Or you can eat them straight out of the ground. They leave a fatty deposit against the roof of the mouth. Ordinary ants are also rich in protein but should be grilled for about 5 minutes to evaporate the formic acid which they secrete. It will otherwise make you ill.

INSECTS – collect all you see if life is at stake. A single cricket has a high protein value. Grubs, caterpillars, grasshoppers and termites can all be roasted, fried or added to soup. Avoid hairy caterpillars. Look for grubs in rotting wood or under stones. Scorpions are delicious - pull off sting (the last third of tail) and twist off head which will draw out viscera.

If you come across an elongated hole, often in a sandy area in the lee of a stone, 25-35mm (1 to 1 1/2 inches) long by about 6-18mm (1/4 -3/4 inch) gently push a twig down it. You'll feel if a scorpion is home. If you cannot draw it up by its pinchers then dig it up, remove the bulbous tail sting and twist off the head (its guts will come out with it) and eat it. Scorpions on the surface are quite easy to catch if you engage their attention with one hand while using the other to sneak up behind and catch the end of the tail. It can sting you only by bringing the tail forward over its

body. They are tasty cooked on the end of a stick or simply by placing them on a hot stone.

Grasshoppers and locusts are tasty and can be eaten raw (highly nutritious) but they are best smoked. The larger dragonflies (catch them with bird lime) and many smooth-skinned caterpillars and grubs (look under dead bark and sun dry them before you eat them) are edible. Caterpillars are best sun dried before eating. I've tried them. I prefer duckling bigarade.

Dried mopane worms – caterpillars with yellow and black stripes are wonderfully nutritious. Again, dry them first and eat them like peanuts. And then there's "mopane bread", a gum-like insect secretion on mopane leaves which can be rolled into pellets and eaten. It is rich in sugar.

REPTILES: Most lizards are palatable but de-gut them first. One way of catching a lizard is to dangle a noose in front of it and then draw the noose over the reptile's head and pull it tight. They are easiest to catch early in the morning when the cold makes them sluggish. You can also kill them with a catapult.

De-scale the extra scaly lizards and then grill, fry or boil them. A crocodile's tail-meat tastes something between chicken and crayfish. Boil it first and then cut away the skin. (They are the devil to catch but a friend of mine, crocodile expert Tony Pooley of Natal, wades into rivers at night and, picking out their little red eyes set close together, catches them barehanded. Make sure their eyes are set close together. If they are set far apart you are looking at an adult and it will undoubtedly be interested in your tail meat. To be serious, don't try it. You could possibly trap a crocodile on a river bank by setting up a heavy fall-trap – a rock or log which, when you pull on a cord or when the crocodile brushes past a triggering device, descends on its head or back).

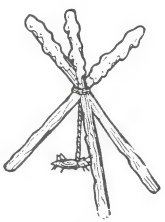
Snakes make good meals. Kill them with a long stick or catch them by placing a Y-shaped stick over the neck and pinning them down. Club them while they are pinned down. Snakes are relatively easy to kill but will writhe about even when dead. Beware of the rinkhals – it habitually feigns death when attacked. Sever the head of any snake to about a finger's length back. unless it is a night adder, in which case cut away the first third of its body length. This is just to make sure you discard the venom sacs. Not that venom is poisonous to eat. It is actually full of protein, but if you have an ulcer the venom could enter the bloodstream and kill you.

Tortoises and turtles are edible. Remove them from the shell, gut them, then place them back in the shell and grill. They can also be smoked.

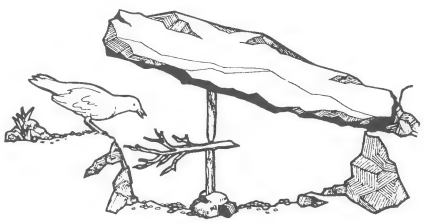
Frogs (caught by using one hand to come in from behind and the other to distract them from the front) taste like chicken when cooked. Remove the head and skin immediately. But as Col. Grainger says: "Never eat a toad", their bodies have toxins.

FISH - see separate chapter

BIRDS: Assuming you have no firearm birds can be hunted either with a catapult, or with bird lime. At a water hole where birds congregate to drink at night you can from a distance hurl a heavy stick (as heavy, but preferably longer, than a walking stick) to travel 60cm (2ft) above the ground and parallel to it. Thrown at a flock, the birds will rise into the path of the stick and you can kill as many as three at a time with luck.



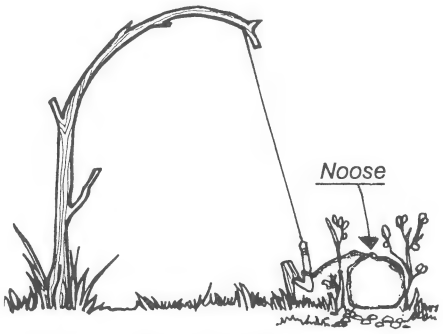
Tripod of sticks coated with birdlime with cricket bait.



Ground below rock is baited. Bird will first alight on twig thus triggering trap.

Bird lime (a sticky substance for ensnaring birds) can be made by boiling the latex (the milky sap) of *Euphorbia* trees or other trees with latex. You can also make it from *Loranthus*, the red candle mistletoe which is also known as "matches". Mash up the wax-like "flowers" of this tree parasite and daub it on grass. *Once you have no further use for the grass trap bury it.* You can also make bird lime by heating a wad of chewing gum. Obviously you would have to study an area first and note the habits of the birds before deciding where best to place the bird lime.

Guinea fowl and other ground birds can be caught by stringing up thin wire nooses or cord nooses along their trails. It is possible to make cord for nooses by stripping the pulp off the leaves of mother-in-law's tongue (*Sansevieria hyacinthoides*) thus baring the strong fibres which run the length of the leaves.



Noose snare

These can then be twined. Pigeons and doves and other seed eaters can be caught by stringing seeds, well spaced apart, on a staked-out thin line of natural fibre.

Birds should be gutted and, ideally, encased in mud and baked on red-hot coals.

All bird eggs are edible – including those with embryos.

MAMMALS: All mammals are edible but obviously it is easier catching small ones than the larger species. Like birds the majority of mammals are active mostly early in the morning. Grazers usually feed day and night. Carnivores tend to be nocturnal as do rodents.

PRESERVING MEAT – build a 3-pole tripod and fix a grate suspended halfway down on which meat can be placed. Build fire beneath, covered with green leaves. You can cover sides of "wigwam" with broad green leaves to concentrate the smoke. Smoke for a few hours – this coats the meat with a protective layer as well as dries it. Fish can be made into biltong by placing fillets on sun-heated rock.

A former administrator of the Transvaal (Sybrand van Niekerk) once demonstrated in the veld how it was possible to "leopard crawl" up to a herd of springbok and catch one by hand! This takes practice but it is possible to set up an ambush at a water hole or riverside and, by using your survival knife as a spearhead (see chapter two) to kill a useful-sized buck. I say it is possible – but it is extremely difficult. More likely you are going to trap one. The most effective trap is the snare (wire or rope) illustrated here. Hand-held nooses can also be used to catch small mammals coming out of holes in trees or banks.

If you are going for medium-sized buck set a 60cm wide noose about that distance above the game track. Mask the human scent with animal dung.

Larger mammals can be caught in pit traps in which heavy upward-pointing spikes have been set and the pit covered by canes and grass. A hippo, because it returns to the river down its steep, narrow "chute" in the river bank can be impaled if a stout enough stake is driven into the bed, just below the surface and pointing in the appropriate direction.

Some tips on catching wild animals:

Look for fresh signs, moist droppings for instance (mucus dries within minutes) and spoor. You can brush a section of trail late at night and examine it next morning for tracks. If you see any leading towards water

TRAPPING AND TREES – set traps under trees rich in fruit. The mpafa or blinkblaar wag-'n-bietjie (*Ziziphus mucronata*) attracts all manner of creatures, so do acacias in pod and, of course, fig trees.

but no sign of return tracks then follow cautiously stopping often and listening. Check for the animal in the distance first, then scan the nearer ground. Make sure the wind or breeze is blowing from the animal towards you and if possible get the sun behind you first because it will make you difficult to see and second because you will be able to see your quarry more easily. Move only when your quarry is feeding or moving, freeze whenever it looks up or stops moving.

Obviously white clothing is conspicuous in the bush or desert but most colours tend to blend; buck are colour blind. Again assuming you have no gun but you do have a spear, make sure you choose small game. Small game such as hare and mongoose can be killed with a catapult. Surgical rubber is best for a "draw string". Always aim for the head and use smooth stones because they fly better. For birds use three or four raisin-sized stones at a time.

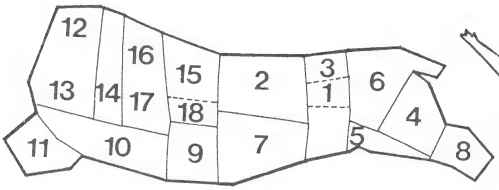
If you are lucky you can steal meat. Bushmen and others will steal meat from predators even rushing at lions to drive them off. I have driven cheetah off a kill and I am told that leopard are sometimes easily driven away from a kill.

Small rodents can sometimes be "fished" for by pushing a short split-ended stick into a crevice in a rock or tree and twisting it so that it catches in the animal's loose skin and fur. Keep turning the stick as you withdraw it. Small mammals can also be smoked out and then either noosed or clubbed. They tend to use the same trails each night and these can be set with snares.

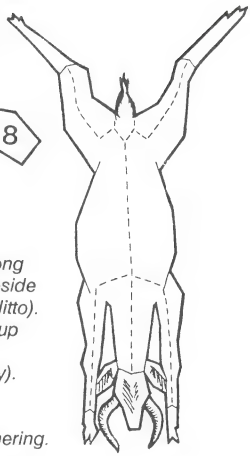
Once you have killed an animal you must drain its blood quickly. Cut the jugular vein in the side of the neck. Don't waste the blood – it is useful for salt and protein.

TRAPPING - don't trap near an animal's burrow because that is where animals are most cautious and where they are most familiar with detail. Nor try it too near drinking places. Along a game trail is best.

If possible string larger animals up on a branch by their hind feet. Using a sharp knife or stone flake cut down from the root of the tail, along the belly to the chin. Place a forefinger under the edge of the skin as you part it from the underlying tissue. Do not pierce the bladder (a yellowish



Cuts of meat: 1. Fillet (will keep for days, ideal for biltong and roasting). 2. Sirloin (ditto). 3. Rump (ditto) 4. Topside (cook slowly after cutting into cubes). 5. Top rump (ditto). 6. Silverside (roast). 7. Hind flank (stew). 8. Leg (cut up small and stew). 9. Flank (ditto). 10. Brisket (stew). 11. Shin (stew). 12. Neck (stew). 13.Clod (stew slowly). 14. Chuck (stew and make biltong). 15. Ribs (roast).



Right: Where to make incisions for skinning and butchering.

organ) or the purple-coloured gall bladder next to the liver. Both are going to spoil the meat. If you do pierce these then you must wash the meat immediately.

Now cut open the underlying membrane from the base of the rib cage to where the thighs join. The large intestine which ends at the anus will need to be carefully cut away from the pelvic girdle. Now tie something tightly around the tube descending from the bladder to avoid it spilling. Remove the entrails, rectum, bladder, glands (in one load) and the lungs and windpipe. Wipe the body cavity down with grass if no cloth available.

Make biltong from the haunches and shoulder meat. Some say the heart, liver and kidneys should be eaten first — then the fillets from along the spine. The rib-cage can be slit down the middle (along the sternum), salted on both sides and then grilled. You can hang the haunches and shoulders for days (tissue surrounding the meat will protect it) and still eat them. Cooked meat keeps longest; cover with melted fat and store. This is where aluminium foil is useful in one's survival kit for it can be wrapped around meat to be cooked in the fire or it can be fashioned into a cooking pan.

Take precautions against hyenas and other scavengers in the bush by hanging all meat as high as possible. Remember the leopard is also a cunning thief and is found in almost all wild terrain in southern Africa.

To make biltong, cut red meat lengthwise into smoothly-cut strips following the grain of the meat and pack it in salt overnight. Peppering or spicing the strips before hanging will keep off flies. Grainger says that even in damp weather you can make biltong providing you cut the meat

extra thin and leave it in direct sunlight, frequently turning it. You can eat this after 3 days.

If you are desperately hungry you can eat quite smelly meat (the left overs, perhaps of a predator's meal) providing you boil it for at least half an hour.

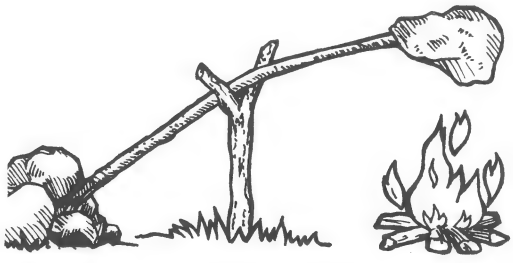
FAST FOOD – the quickest way to cook meat is to hold it over coals, as close as possible, on a stick. The outside may burn and will harden but it will seal juices inside. A pit lined with stones will get hotter and stay hotter than an earth pit.

The safest parts of an old carcass are the thick meaty areas (muscle). These should be cut into small cubes. Boiling will kill worms and flukes which might be present in the meat. Boiling food destroys some nutrients but saves vitamins and minerals and providing you drink the cooking water afterwards you will have received most of the benefits of the food. If you have been boiling rotten meat to make it edible then best throw the water away. Roasted meat is tastiest but vitamins, minerals and a lot of the fat is lost. Fat is invaluable if you are facing days of privation.

By turning the meat on a spit you can keep the fat within the meat. Any roast should be done slowly but this might not always be practical. If you roast over a very hot fire be aware that the inside meat may still be under-cooked and thus harbour pathogens. You can slice off and eat the outside while the rest continues to cook.

Roasting or broiling is the quickest way to prepare prime cuts. Skewer it on a stick and hold it near the glowing coals so that the burned outside seals in the juices. (Roots and tubers taste better when roasted by the way).

Small mammals are better boiled before being roasted. Fish can be grilled on a grill of green sticks or placed in foil on the coals. Frogs, lizards and small birds can be roasted on the end of a stick but snakes are better if boiled first. Mussels and other shellfish are good in a vegetable stew. Crayfish are best boiled. Don't eat any you find dead.



Simple meth of roastihg

PEMMICAN — a North American Indian "iron ration" which can be adapted for Africa. First pound some dried fruit into a paste, then crush biltong into a powder and mix the two. Now mix with melted fat into egg-size balls which can be kept in plastic bags. They can last weeks. Indians push them into cleaned-out intestines sealed with suet and tied off like beans in a pod. You chop off as needed.

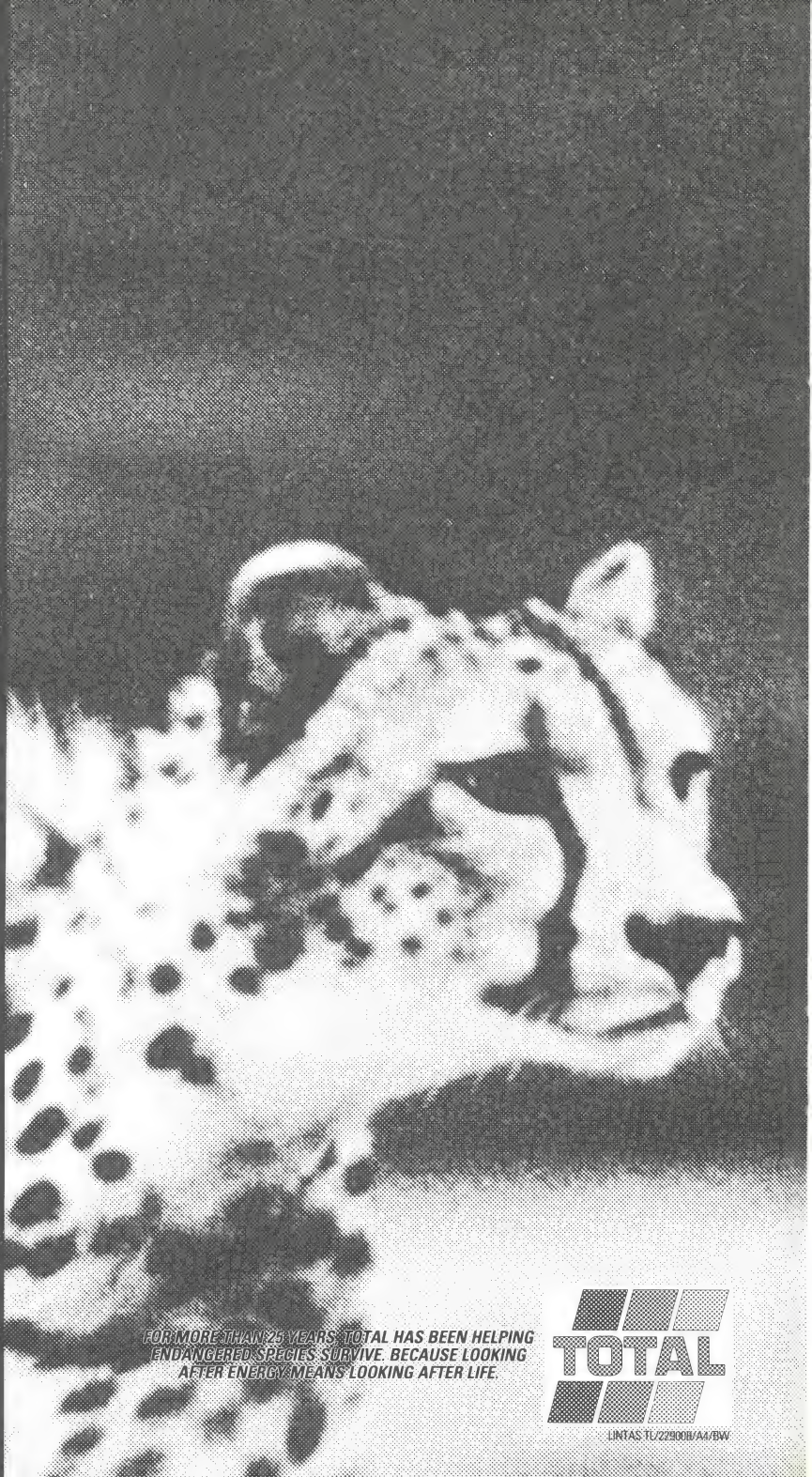
HONEY: here is one of nature's most valuable foods. And among nature's most astonishing birds is the drab-looking honey-guide, (see illustration) which, by calling and flying on ahead and then calling again, will lead you to a beehive. The hive is likely to be in a tree-hole or crevice in a rock. By setting fire to a bundle of grass or a stick and blowing the smoke into the hole for 5 or 10 minutes you will be able to drive the bees out. Grainger warns that the most vicious bees are those in rock crevices. I am not sure whether this observation applies outside Zimbabwe where the Colonel gained most of his experience but African bees (*Apis unicolor and A. adonsonii*) are generally irascible and dangerous. They kill 10 people a year in South Africa, and maybe more.

Once you have taken your fill of a wild bees' nest it is a tradition throughout Africa to leave some honey comb and grubs for the honey guide itself. Folk lore says if you don't the next one will guide you to a black mamba or angry elephant. Apart from this consideration it seems the decent thing to do anyway.

There is also the stingless mopane bee (one of the social bees) of the genus *Trigona*. Their main defence is to swarm in one's face and crawl into the nostrils, eyes and ears, buzzing and biting. But these harmless tiny bees which rest in holes in mopane trees produce good honey. You can spot the hole by looking for a small wax funnel which protrudes from the bark and is closed up at night with wax. There's a similar species of stingless bee which nests in the ground. Both produce a slightly sour and thin honey relished by locals. In Natal people break off the branch of the tamboti tree (of the Euphorbia family) and place it in a clearing. The mopane bees are attracted by the latex "bleeding" from the branch and the direction from which they arrive betrays their nest location.

Honey aggravates thirst. But it keeps well and is very nutritious.

ENERGY FOR LIFE



FOR MORE THAN 25 YEARS, TOTAL HAS BEEN HELPING ENDANGERED SPECIES SURVIVE. BECAUSE LOOKING AFTER ENERGY MEANS LOOKING AFTER LIFE.

TOTAL

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Chapter Five

Lost and found

"Follow me - follow me 'ome!"

Rudyard Kipling

Once you realise you are lost find a shady spot, sit down and take stock. If it is going to help to retrace your steps (and if you think you will be able to) then that is your first priority. You will face a similar situation should you have suffered a vehicle breakdown or survived a forced landing in an area far from any frequented route. You may even suffer shock which is a good reason to relax. If possible, drink water — it's a good remedy for shock. In the case of a breakdown or forced landing there is a lot to be said for staying put in the hope a search party will find you, especially if your route plan and estimated time of arrival were known to others. You can in fact set about making your position more conspicuous to anybody searching from the air such as burning the tyres to create heavy smoke. Now have a good look at your water and food situation.

But if you are not found in reasonable time or if you believe there is very little likelihood of being found there obviously arrives the time when you have to move out. Seek out a hill or tall tree and climb it and scan the horizon all around. Take note of all landmarks including large trees, distant tree-lined river courses and so on. Try again at dusk and dawn to see if there are signs of smoke or lights from a settlement.

Note the direction of any aircraft. Light aircraft could provide a clue to a distant airfield while repeated sighting of airliners would indicate an international route which you could probably take a guess at and thus add another clue towards working out your own position.

Try to reconcile the landform with your map. If this is impossible then take bearings and make a rough map of your own situation — a map you can expand upon as you travel until you have enough clues to find your position on your printed map.

When you abandon a vehicle remember there is drinkable water in its radiator and battery. The mirror could be useful as a signalling device — take it.

Determine a route and stick to it. Head for an obvious but distant point. If the landscape is featureless try to maintain a straight line by using the sun's position as a guide or, in desert sand, by looking back at your tracks to ensure they are in a straight line. You can also achieve this by

piling stones every few hundred metres so that three piles are always in view and in a straight line.

Should you come across a river then obviously follow it down stream. It will be a lifeline for water and food including fish and fowl. Fortunately or unfortunately, depending upon circumstances, southern Africa has few large rivers which might prove difficult to cross. The main hazards are floods, bilharzia (in east-flowing rivers), crocodiles and hippo (bushveld).

In the case of a river being in flood you usually need to wait only a few hours, if that, for it to subside.

It makes sense when crossing a river to send the strongest swimmer first, with a rope, assuming you have a rope. (If not, you can make one by stripping the inner bark, spiral fashion, from a riverine tree). The strongest swimmer can then anchor the rope on the other bank for a rope crossing. Otherwise non-swimmers can use anything that floats or a line of people can link arms, with non-swimmers in the middle, and wade across all facing parallel to the opposite bank. The heaviest swimmer should be the anchor upstream. A long pole can be used as a grip to keep people together. If one has enough rope to form a circle with a diameter wider than the river then only one swimmer is needed. He swims across and the rope is then hauled around in a circle by two people on opposite banks while non-swimmers are tied to it by a loop under the arms and are pulled across, the rope being moved around like a conveyor belt.

ROPE MAKING – ropes can be made from the bark of the baobab (*Adansonia digitata*) and brachystegias such as *B. speciformis* (the Msasa of Zimbabwe) and *B. boehmii* (Mufuti) - especially from saplings. The inner bark of the mopane or wild fig can be cut in a narrow band, spiral fashion, from around the tree and will make strong cordage.

Incidentally one can make a flotation device out of wet clothing, especially trousers. Tie off the legs, zip up the fly, hold them aloft with the open waist facing in front and bring down smartly to fill the trousers with air like a wind-sock. Pull the belt tight and then lie across the crutch and you have water wings.

If you find yourself sinking in a bog do the breast stroke and let your legs come up behind you. Staying as flat along the surface as possible make for firm ground.

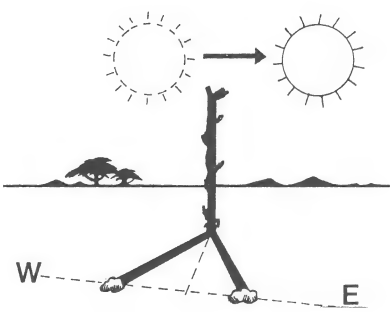
When walking at night walk slowly.

In using a compass and map remember that in southern Africa there is a 20 degree west variation between magnetic North and "true North"

as referred to on maps. Bearing this in mind true North on your compass is 20 degrees to the left of the needle (20 degrees is a little less than half a right angle). Incidentally, when taking a reading lie the compass down flat and make sure there is no metal object near it. If the reading appears wild it could be because of some natural geological interference. Move on a little distance and try again.

You can make a compass by holding a sewing needle between thumb and forefinger and scraping it over a magnet in one direction only, or even over some silk. Tie some cotton around the centre of the needle and the magnetised end will point to the magnetic North. You'll get a more accurate reading by floating some paper or grass on water in a tin and placing the needle to float on it.

An easy method is to point the figure 12 of your watch at the sun. The angle between the 12 and the hour hand will point to true North. Where the sun is overhead in summer (North of Capricorn) this can be difficult. Grainger points out that in Zimbabwe, which is well inside the tropics, from November 14 to January 29 the line will in fact point South not North because the sun reaches its zenith either North or South of the country depending on the time of year. (Central Zimbabwe is in line with the Okavango Delta and Damaraland in Namibia). Another way to get a bearing is to push a stick into the ground and mark where the shadow ends with, say, a stone. Half-an-hour later again place a stone where the shadow ends. A line passing through both stones would indicate the East/West line.



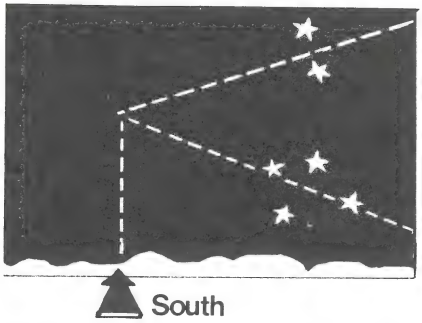
Keep checking your line of march.

There are other less refined natural signs of North and South. Tree trunks are darker on the South side (in the Southern Hemisphere) and grow moss on this side.

The buffalo weaver builds its untidy twig nest only on the west side of trees as does the white-browned sparrow-weaver. (See illustration).

An easier but just as rough a method is to stand with your back to the sun at dawn, raise your right arm sideways: you are now pointing North.

The "compass plants" *Euphorbia schoelandii* and *E. tuberculata*, of the dry West both lean over distinctly towards the North. The latter is



known as the "Noordpol" (North tuft) plant and sometimes "Noordpool" (North pole plant). Mesembryanthemums (vyge) flowers face North.

The best direction finder at night is the Southern Cross. It has four stars in a conspicuous kite configuration (see illustration) and close by another two bright stars called "the pointers". Draw an imaginary line through the long axis of the Southern Cross and extend it across the sky. Now imagine a line joining the two pointers and bisect it at right angles, taking this line too across the sky. Below where these two lines meet is South. Some people just take the long axis of the Southern Cross and extend it four and a half times. Below where the line ends is the South Pole.

Hudson Bay pack

When marching take it slowly, rest at least every hour for 10 minutes. Get plenty of sleep. If you have no proper rucksacks you can make what John Wiseman (The SAS Survival Handbook) calls the "Hudson Bay pack". You need a strong piece of preferably waterproof material. You place two small stones in two diagonally opposite corners and tie a cord around them – a cord long enough to go around your waist or loop over your chest like a rifle sling. You then wrap your belongings in the cloth like a long sausage and sling it over your back or around your waist.

While it is good practice to travel down a stream – all streams flow into bigger ones and into rivers and all rivers have settlements – it is wiser to walk along the watershed ridge above the stream because the actual stream course will pass through difficult swamps, gorges and sometimes dense riverine forest. At night camp below the ridge where it will be sheltered but well above the river – for one thing it will most likely be warmer above the river (cold air sinks) and, in big game country, a little safer. Don't leave leather, boots, clothes or anything that smells of food or blood on the ground. Hoist it high into a tree. Hyenas can steal or damage crucial equipment. They have been known to mash up unopened food cans, eat footwear and buckle the blades of knives and spears.

SIGNALS

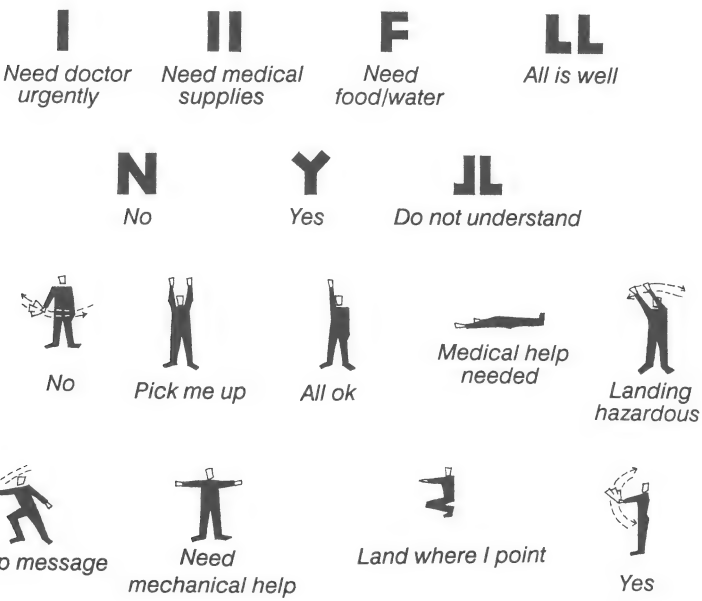
If there is one thing the nations of the world have reached agreement upon it is in the field of distress signals.

Below are some of the more common.

The first two groups involve ground-to-air signals.

Remember that the bigger the signal and the more it contrasts with its background the easier it will be spotted and read from the air. The more geometrical the sign the more it will contrast with natural landmarks. Trenches which create geometrical shadows will attract attention.

At the bottom of the page is the Morse Code.



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b — ● ● ●	h ● ● ● ●	n — ●	t —	z — — ● ●	6 — ● ● ● ●
c — ● — ●	i ● ●	o — — —	u ● ● —	1 ● — — — —	7 — — ● ● ●
d — ● ●	j ● — — —	p ● — — ●	v ● ● ● —	2 ● ● — — —	8 — — — ● ●
e ●	k — ● —	q — — ● —	w ● — —	3 ● ● ● — —	9 — — — — ●
f ● ● — ●	l ● — ● ●	r ● — ●	x — ● ● —	4 ● ● ● ● —	0 — — — — —

SIGNALS: When you eventually abandon a camp site and there is a remote chance that a search party could come across it, leave a note – especially if you have left behind a vehicle or aircraft wreck. State your plan as precisely as possible. If nothing else it will encourage the search to go on. Put the note in an obvious place.

There is an international code of visual ground-to-air signals (see illustration). When abandoning a camp leave behind an arrow mark pointing the direction you have taken – one that is visible from the air and one clearly visible to a search party on the ground. On the trail too leave blazes on tree trunks or arrows on the ground made from stones. But remember that in the mountains and in the bush, baboons habitually turn stones over in their search for scorpions.

Two sticks pushed into the ground but crossing each other scissor fashion indicates "not this route". A 'Y' shaped stick laid on the track indicates "this way", the leg of the 'Y' pointing the direction. A large rock upon which has been placed a smaller one and then a small rock just beyond indicates "this way". On a grass covered plain you can tie a tuft of grass so that the seed head points out your route. An arrow carved on a tree trunk is also useful. Three sticks placed like a cricket wicket or a line of three rocks mean danger or an emergency.

If a rescue is attempted by air there are signals which you can give on the ground to assist landing or the dropping of supplies (see illustration).

Megan Anderson – Environmental Control Officer at the Palmiet hydro-electric scheme.

RESCUE BY RESCUE "CHOPPER" – these days rescue is usually by helicopter. When the sling is winched down to you let it touch the ground first otherwise the static can be alarmingly strong. If in thick country try to clear a landing pad 30 paces across. Anything above knee height would have to be cleared. Chopper will come in against the wind at a 15 degree angle so clear down wind with this in mind. Try to indicate a wind direction by making a conspicuous "T", the bottom of the "T" pointing into the wind. The international sign for "pick me up!" is to raise the hands as if you are being mugged. When the sling has been lowered push your head and shoulders through and let the strap grip under your armpits.

More often than not helicopters are used these days, at least for the final rescue. If there is no natural area for a landing pad then you can probably clear one. A helicopter needs 26m diameter (80ft) but 30m is ideal. Everything over knee-height would have to be cleared and there should ideally be a clear approach path into the wind 30m wide. Mark the centre of the landing pad with a conspicuous H if you can – you might be able to use clothes to do this, or fire ash.

Power plants versus plant power.

When you're standing in the Kogelberg mountains amongst unspoilt fynbos and indigenous trees,observing the construction of a giant hydro-electric plant, it is impossible not to feel a responsibility towards the gifts of the earth.

At Escom we believe that while we need to develop South Africa's resources, we should not deface its natural beauty. So we educate every person at Palmiet and other construction sites to understand and respect the priceless value of nature. At Palmiet pumped-storage scheme Escom has also integrated its technology with the fynbos environment and ensured its continued protection with the appointment of an independent environmental impact control officer. Because construction projects come and go. But once fynbos has gone, it is gone forever.

This is part of the general environmental approach at Escom. No matter where construction is planned, environmental surveys will identify valuable resources, including rare plant and animal life, and plan for their survival – as when the 'Ouvolk' lizards were relocated at the Majuba power station. Seed-carrying topsoil is conserved and replaced after construction to maintain the natural flora and land use capability of the area. Refuse disposal is controlled so as not to attract unwanted animals. We also protect birds nesting in pylons and combat pollution.

So, while our chief function is to supply electricity to a fast-developing South Africa, we're also looking after the times when you'd like to get far away from the bright lights to rediscover the wilderness.

Should you want to know more about Escom's environmental programmes, write to The Communication Manager, Escom, PO Box 1091, Johannesburg 2000.

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SURVIVAL KIT – Alonzo Pond says of desert survival (and he is the world's acknowledged expert) "a mirror is absolutely critical". It is the most powerful tool you have for communicating your presence. In sunlight a simple mirror can generate 5 to 7 million candle power of light and can be seen from 10-20 kilometres away.

If you can wet the surface of the landing pad it would save a dust storm and thus make landing less hazardous, especially if the pad is dangerously constricted. If it is a mountain rescue and there is snow then trample it down as much as you can. At night try to illuminate the ground with torches. The helicopter can use its own lights once it sees the pad. Don't shine the torch at the chopper.

If there is a wind it would help if you could form a "T" on the downwind side – the leg of the T pointing down wind. If nothing else a person could lay down making a T with his arms and body. His head would be against the wind. A small smoky fire would help the pilot read the wind direction.

One can buy light-weight and relatively small flares these days and some people who are frequently risking being stranded in a remote area might feel that flares are essential in a survival kit. There is one the size of a pen, with a hand-held discharger and it comes with a set of eight mini-flares. You simply screw on the fingertip-sized flare, hold it up at arms length and pull the discharger's trigger.

Three short flashes with a heliograph (mirror) or a torch; even three smoke puffs or three blasts on a whistle means SOS, a signal recognised throughout the world.

Chapter Six

Shelter and fire

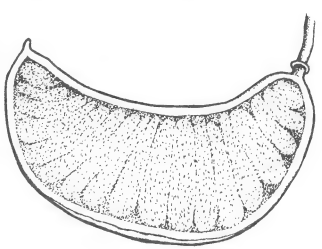
"Our shelter from the stormy blast".

Isaac Watts

I have mentioned elsewhere the wisdom of avoiding camping near rivers – especially in the mountains where streams can in a matter of seconds turn into raging torrents causing boulders the size of cars to go bouncing along the stream bed. In the bushveld and desert temperature inversion can cause river valleys to be numbingly cold while, a couple of hundred metres away the air is much warmer.

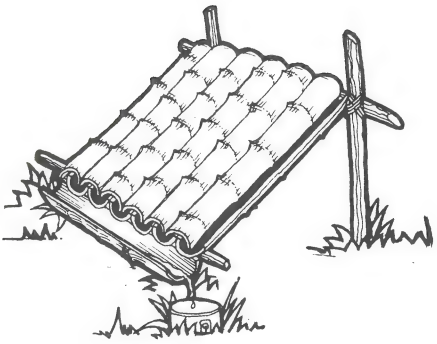
Avoid camping beneath any large fruit-bearing trees such as wild fig, mashatu or marula, first because you will be plagued by insects and second because the shade of such trees also attracts elephant and other mammals including monkeys and baboons. The shady camelthorn which is such a conspicuous tree in the arid west (Acacia erioloba or A. giraffae as many still call it) are equally inviting and equally dangerous for the same reason. Their underbrush harbours ticks. The tree is recognised by its flattenned, grey furry pods and very loose and stringy bark.

There are many excellent books on building makeshift shelters, (The SAS Survival Handbook and How to Survive on Land and Sea being the best I know) but when all is said and done the lean-to is adequate for most purposes and is the easiest to build. Given a parachute or tarpaulin one can erect a mansion in a few minutes. Given such circumstances you need just four saplings tied together like a wigwam and you wrap the fabric around it.



Acacia erioloba pod

The lean-to needs but two trees or upright poles 2m (6ft) apart. You tie a sapling across them 1,25m (4ft) above the ground and then two more sloping to the ground from each end of the cross-piece. (See diagram). The shelter can be thatched. You gather bundles of grass and then you tie them along the lower part of the screen first. Next layer must overlap the first and so on upwards. This enables the rain to run off. If there is



Bamboo shelter/water trap

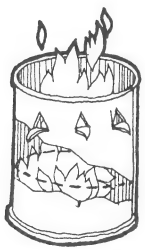
thick bamboo available make a gutter (by splitting the bamboo down the middle) on the ground at the base of the sloping back screen so that the run off can be channeled into a sunken pot.

Cordage can be made from bark stripped from suitable trees. Sapling bark is best. You can also use mother-in-law's tongue – strip off the leaf pulp exposing the long silken threads and twist them into cord.

To turn your lean-to into a deluxe model simply add an opposite side (sloping) and block off one end of the hut completely. For a comfortable bed pile grass as high as possible – as much as 1,5m (4 1/2ft) if possible. By the time you lie on it it will flatten down to mattress thickness.

SWEAT LODGE – This is a Navajo Indian's crude shelter for cold areas and is built over a shallow pit and covered in earth. All gaps are sealed and fire is built outside in which large stones are placed. A stone at a time is taken from the fire (using wooden tongs) and placed in a shallow fire pit in the hut. As the stone cools it is exchanged for one in the fire.

FIRE: There are many circumstances when a fire is man's best friend – one of those circumstances is when you are alone in the wilderness. Even more so when you are lost! Today with these cheap and extra-small butane lighters one need never be without the means of producing a flame and I am not sure why survival books continue to go on about matches. But if you are one who prefers matches for some reason then your first concern must be to keep them dry. First never set out without replacing your survival kit matches with fresh ones. Drip candle wax on their heads as extra protection against damp. You scrape it off when you want to strike the matches. If you cannot buy "strike-anywhere" non-safety matches then don't forget to carry a striker strip with you – and keep it



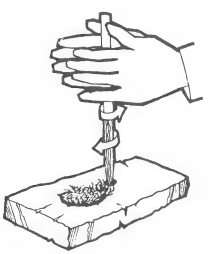
Tin can fire. The fuel can be petrol-soaked sand, or a petrol-oil cocktail. Bury the tin half in soil and put pot straight on top

dry too! Film cassettes (the 35mm type) are ideal containers for matches. The lid can be taped with waterproof insulation tape.

A good cooking fire can be made by bashing fair-sized holes just below the rim of an opened can, filling it up to one third full with dry sand and then adding petrol. Light the sand and stand a pot directly on the can. You can also burn oil by mixing it with petrol. Dried elephant and buffalo dung burn well. Smouldering elephant dung is a good insect repellant.

The SAS Survival Handbook has several fuel ideas but one intriguing way which might come in useful one day – string up a can of oil and a can of water so they both drip into an inclined gutter (this could be of split bamboo). Place sticks in the leak-holes of each tin so that you can speed up or decrease the flow. Let out 2 or 3 drops of water to one of oil. If this mixture drips on to a metal plate (I suppose a frying pan would do) which you have pre-heated by lighting a small fire underneath, it will produce a constant and fierce little fire.

You can start fires with a magnifying glass (the latest Swiss Army Officer's Knife has a magnifying glass) with a lens from your spectacles or binoculars. A more laborious way is to strike your knife blade on hard rock – the knife should be struck downwards so that sparks fall into your tinder pile (this can be of anything combustible including a small pyramid of dried straws from an elephant dropping or the lining from a bird's nest).



One can also produce fire the really primitive way. Take a piece of hardwood and cut a small depression in it which you fill with tinder. Next to it make a small groove, pepper this with a few grains of sand. Now find a pencil-thin soft wood stick and drill it into the hardwood groove going faster and faster. You drill by hold-

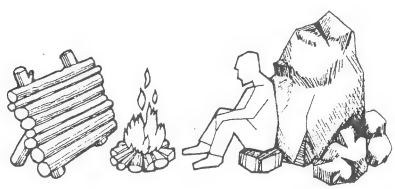
BUSH AND MOUNTAIN FIRES – Bush fires can be a killer. If you see one make for a stream. Although the fire can jump it you at least stand a chance of being able to duck in the stream. On a hillside remember fire travels faster up a slope. With a grass fire you can often run through it to the burnt-out side. Mask your face in a wet shirt if possible. Once you have decided to go for it take a deep breath and don't stop running no matter how hot it gets. If there is no escape and you cannot risk running through and you have no time to burn a fire break ahead of you – then find a depression in the ground, cover yourself over with whatever you have and, if possible, pull earth on top of you.

ing the softwood stick between your palms and rubbing the palms together.

Eve Palmer in her "Trees of Southern Africa" writes "The wild fig, *Ficus capensus*, which is widely distributed, and sticks of willows, *Salix* species, and *Commiphora* species, yield 'fire-by-friction' woods. The tinder is often dry grass, old dry willow wood, dry manure or sneezewood shavings which burn even while green".

Another method of "rubbing sticks" is to cut a long groove in a soft wood block and then grind the tip of a hardwood stick up and down the groove. Hold the stick at an angle pointing forward and have at the front end of the board a little pile of tinder. The rubbing process itself will also provide a little of its own tinder. Sand grains aid friction. I must warn you, it takes practice.

A fire serves three purposes: it provides warmth, a cooking facility and a great amount of comfort tinged with a rather false sense of security. (Be warned, hippo have an eccentric dislike of fire and sometimes charge through them. Rhino, some say, do the same).



To increase the warming effect of a fire build behind it a "reflector" – a 1.5m high (4 1/2ft) log wall- by simply dropping poles or lengths of saplings in between upright poles

In a high wind dig a fire trench well over ankle deep. You can line this with stones and build your fire on the stones. Such a fire place remains hot well into the night. Two Y-shaped sticks at either end, a stout green sapling across them and you have a spit. Surround a small fire with rocks, these make it last longer and also make it warmer for a longer period and provide something on which to rest pots.

The golden rules of fire-making are to find the most sheltered spot; have lots of kindling on standby; in wet environments even green twigs will provide kindling especially if split; begin with a small pyramid shaped fire and add to it a "wigwam" of sticks.

Remember a fire needs air – do not make the mistake of smothering it. You can keep a fire smouldering all night by banking it up with green logs and sheltering it against drafts.

Cooking is best done over red hot coals rather than flames.

SIGNAL FIRES: You can prepare a stand-by signal fire — one that will leap into life immediately you put a light to it. Keep it dry by either placing palm fronds on top of it or even building a thatch shelter over it. Keep aside material that can be added to the blaze — and which will make it smoke. The latter can be achieved by using green sticks and leaves. A single spiral of smoke in a lonely landscape is very conspicuous.

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Walvis Bay
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Phalaborwa
Nelspruit
Piet Retief
Pietersburg
Johannesburg
Bloemfontein
Durban
Onseepkans
Upington
Prieska
Mafikeng
Cape Town
Port Elizabeth

Malaria area Endemic
Malaria area Epidemic

Malaria is a known killer disease – or at its best can mean prolonged suffering. The shaded areas on the map indicate where Malaria is still active and infection could take place. But this doesn't mean you need avoid your favourite holiday resorts; by taking simple, sensible precautions travellers to these regions can ensure a worry-free holiday and prevent extreme discomfort.

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Chapter Seven

Dangerous animals

"Save me from the lion's mouth".

The book of Common Prayer

Looked at from the point of view of big predators Africa is by far the most dangerous continent in which to wander around lost. So many of its creatures have a track record for killing people — the elephant, buffalo, rhino, hippo, lion, leopard, hyena, crocodile, ostrich, umpteen snakes and even the honey bee. For all that not many people are killed by any of these. Nevertheless never take liberties and treat all large animals with respect. In 1986 a hiker in the Golden Gate National Park was charged by an injured eland, thrown on to her back and, fortunately for her the animal's horns dug into the ground each side of her waist! Sable, buck, tsessebe, black wildebeest and bushbuck have all been known to attack and injure people. Indeed the black wildebeest has killed at least four people to my knowledge.

ELEPHANT In southern Africa elephant kill perhaps two or three people a year, not more. Most victims were simply trying to protect their crops from being trampled by elephants whose natural habitats are being compressed by civilisation. If you come across an elephant in the bush freeze until you can gauge its intentions. Stand behind a tree if you can but keep the elephant in sight. Its eyesight is poor and it will almost certainly be more scared of you than you of it. If it comes at you with ears spread out, trunk up and trumpeting then it is almost certainly just trying to scare you with a mock charge. If you cannot find a tree to get behind then slowly back off. It will usually stop in mid charge. If it does come for you again, but this time with its ears back and trunk tucked under its chin, then dive to one side and stay put. *Whatever you do don't run. That is the golden rule when faced by an angry animal.* I cannot think of a case for many years when a person killed by an elephant was not running away at the time or was not behaving in a way that was provocative.

RHINO are also avoidable. White rhino tend to run away but occasionally charge blindly. Get behind a tree. If there is no tree then shout loudly. "Voetsek!" seems to be universally understood by white rhino! If it still comes on then leap sideways and it will pass you by. They are not by nature aggressive. The smaller black rhino is more nervous and far more dangerous. If you see one, freeze. Remember, its eyesight is poor. From 15m it cannot see you clearly. Meanwhile look for a suitable tree to climb — as long as you can get about 2m off the ground you are out of harm's way. Don't risk a charge, the black rhino weighs 1,5 tons but

can turn on a 5c piece. If there is no tree slowly walk backwards. If it charges fling yourself aside at the last moment. Some people have diverted a charging rhino's attention by flinging some article of clothing in its direction before leaping aside and lying perfectly still.

HIPPO are really dangerous. Out of water they will tend to run away (seeking the safety of the water) but if you are caught between a hippo and its refuge then expect it to come for you. Dive out of the way. Never provoke them in the river. They have a tendency to charge at camp fires – but it does not happen nearly as often as people say. (For years children on wilderness trails have camped near hippo-infested bushveld rivers without serious incident).

BUFFALO generally speaking, are like cattle but more nervous. Hunters have actually pushed their way on foot through buffalo herds. An injured buffalo is another story. It can be cunning and very determined to nail whoever happens to come within range. If one does come for you – and they usually charge nose up – climb a tree. You'll not outrun it. I remember Tobie Rochat of Acornhoek being horned against a taaibos (a springy shrub). Each time the buffalo pressed down Rochat felt the bush cushioning him. When the buffalo released its pressure, Rochat found himself upright again! The buffalo gave up. Moral: stay calm whatever happens!

LION take very few people – perhaps three of four a year in the whole of southern Africa, and as often as not victims are drunks teetering home at night. They often try a mock charge, but 99.9 percent of the time they will simply retreat on seeing a person approach.

If you run up against lion slowly back off and they too will pull back. If you run they will surely run you down. There is almost no doubt on this score. If you are ambushed by a lion you will likely end up with it on top of you with the arm you threw up to defend yourself now in its mouth. Let it have your arm (as one survivor said), and it will pre-occupy it while you reach for your gun or knife. In December 1986 Paul Bekker a Marondera, Zimbabwe tobacco farmer was seized by the leg by a lioness in the Zambezi valley. It had broken into his hut. He stabbed it to death with his knife which was hanging next to his bed. (A salutory example of why it is wise to sleep with one's knife nearby). A few other people have managed to throttle lions while the big cat pre-occupied itself with a limb. As with all big game if you see lion freeze, watch, and retreat slowly backwards if you can. The human voice may frighten them off and some people have actually scared a lion off by running at it.

LEOPARD are as timid as buck, but an injured leopard is a fast, aggressive and dangerous animal. I researched 32 reported attacks in Zimbabwe, Namibia, Mozambique and South Africa between 1960-1964 and none was fatal but 31 people were mauled. All the leopards had been either provoked by a hunter, a dog, or had been injured. In all success-

ful hand-to-hand combat cases the leopard had been choked to death. In four of the cases a punch on the nose had sufficed to make it retreat.

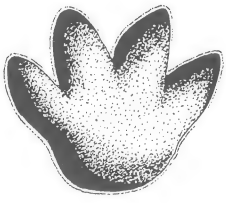
Nevertheless don't take chances: retreat, moving sideways and away rather than directly backwards, and don't stare it in the eye (or for that matter a lion). A direct stare is taken by the big cats as a sign of aggression.

A leopard tends to latch on with its claws and sink its fangs in where it can. It is ferocious rather than courageous. It is fairly easily choked to death — or so it appears.

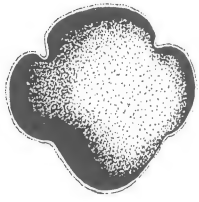
CHEETAH have never harmed anybody.

HYENA the spotted not the brown (which appears to be harmless), have killed a few people but very few in recent years. They tend to bite at the faces of sleeping, drunk and meat-smeared revellers around camp fires.

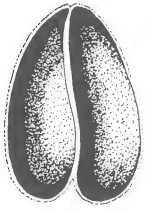
Hyena (spotted)



Hippopotamus



Rhinoceros



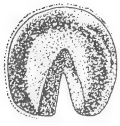
Buffalo

Lion

Leopard

Porcupine

Impala



Zebra

Ostrich

Wild dog

Caracal

CROCODILE are notorious man-killers and annually take several people in the southern African region. If you are seized by one your only hope is to stab at its eyes with anything available. Quite often a smallish crocodile will take on more than it can swallow and you might be able to haul it out of the water where you could deal with it on more equal terms. Assume every subtropical and tropical river and pool has crocodiles. Their presence is extremely difficult to detect. They cannot knock you off a river bank with their tails as some people claim but they can rush out jaws first although that is very rare. I have not heard of such a case involving a human. Mostly they seize people wading in the shallows.

BIRDS: The only potentially dangerous bird is the **ostrich** and the only deaths in recent years have been caused by domestic ostrich on farms. Nesting ostrich will fight you off. If one does compromise you remember it kicks forward and has a "flick-knife"-like toe nail which can disembowel you by raking downwards. Best defence is a branch from an acacia thorn tree or to lie face downwards protecting the nape of your neck with your hands until it goes away.

OTHERS: One way of keeping wild animals away at night is to urinate around your campsite – small drops at a time – against the base of trees, rocks and grass. Most animals including lion respect territories marked in this way and tend to skirt round them.

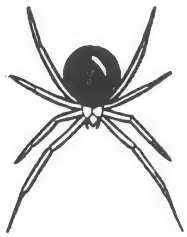
Before getting on to snakes and snake-bite treatment there are a few tiny creatures which need to be mentioned.

SCORPIONS: there are two important families in Africa – *Scorpionidae* and *Buthidae*. The former has large, impressive pincers (pedipalps) and a thin poison sac on the end of its curled-over segmented tail. They are no problem. Their poison is very weak. *Buthidae*, of which there are a number of species in our region, have small pincers and a large venom sac. They can kill people sensitive to their venom but deaths are extremely rare – maybe one every 10 years. There is an anti-venom. *Parabuthus* scorpions, a genus common in our region, live mostly in the semi-arid to arid areas in the west, and can squirt venom forward. Venom in the eyes, considering it is, drop for drop, more potent that the cobra's, can be dangerous. The eyes must be irrigated with water or whatever else is at hand (even urine). Scorpions, active only at night, live up to 1m (3ft) underground. I have come across a case where a youth was stung by a *Buthia* scorpion and a cold compress given. He was fine after a couple of hours of discomfort. Anti-histamine should help – and rest always helps. Because scorpions are active at night shake out clothing and boots each morning when in the bush.

BUTTON SPIDERS: southern Africa has two species, *Lactrodctus mactans* and *L. geometricus*. Both are half the size of a pea, shiny and may have red markings under the abdomen. They can be brown or black. *L. mactans* is the same species as the American black widow which in the

US over 250 years has been responsible for only about 30 deaths. In South Africa I recall one death only.

L. mactans is extremely common and non-aggressive. The venom is neurotoxic (affecting the nervous system) it being, weight for weight, as powerful as a cobra's. About 5 percent of untreated bites are fatal according to "African Insect Life" by S.H. Skaife and J. Ledger (Country Life 1979). This figure may be out of date. The SA Medical Research Institute says only 2 percent of bites are troublesome. Fatalities are extremely rare.



Button spider

There are some much bigger and uglier spiders, some with nasty (mechanical) bites — but none is lethal.

BEES: African bees are notorious for their sometimes lethal stings. Although the average person will feel little discomfort from a bee sting some people, inexplicably, react badly. There are 10 or more fatalities a year in South Africa alone. An ice cube on the bite plus, if symptoms are bad, an antihistamine tablet helps. Remove the sting by scraping it away with a finger nail. Don't grasp it to pull it out as this will pump more venom in. When death comes from an African bee (*Apis mellifera*) it comes very suddenly.

TICKS: These are arachnids which can cause tick-bite fever, a 3-week fever if no treatment is given. Examine your body for them at the end of the day (don't miss the tiny pepper ticks) and ease them off your skin by applying paraffin, Vaseline, alcohol or heat from a lighted cigarette. If you pull them away without getting them to voluntarily release their grip you will leave the head behind and risk infection. Seek them out particularly behind the knees, in the groin and along the waist. Avoid getting them on your skin by rubbing paraffin on your legs.

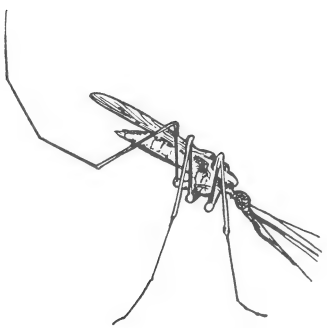
BILHARZIA (Schistosomiasis) is present in most lowveld rivers and is prevalent throughout Mozambique and Zimbabwe. It is almost never a killer but it can be extremely debilitating and unpleasant in other ways — and is not easily cured. In extremely rare cases it can go to the brain with lethal results. If you have to put your hands in a stream you suspect has bilharzia (such as when fishing) then clean your hands immediately by vigorously rubbing them dry with a cloth.

MALARIA in the last few years has re-established itself in southern Africa. In South Africa, where for a generation it was subdued, it has during the 1980's increased alarmingly. In 1985 10 000 cases were reported in South Africa and 21 died. Because of the fact that not all cases are reported one can view these figures as underestimates.

Malaria areas in South Africa(where the disease is always present) are the entire lowveld along the Limpopo, down the Eastern Transvaal, all of Northern Zululand down to Durban. Much of Zimbabwe is malarial and practically the whole of Mozambique.

The following South African magisterial areas are considered (mid 1987) endemic malaria areas: Messina, Soutpansberg, Sibasa, Pilgrim's Rest, White River, Nelspruit, Barberton, Piet Retief, Ingwavuma, Ubombo and Kruger Park.

Epidemic areas (where the disease appears only after optimum breeding conditions) are the course of the Malopo River in North Western Cape from the Transvaal border to the Orange River and then down the Lower Orange from Prieska to Onseepkans. Malaria in these parts is rare. There are easily obtainable tablets on the market (ask your pharmacist) which must be taken two days before leaving, once a week while in the area, and then weekly for a month after returning home.



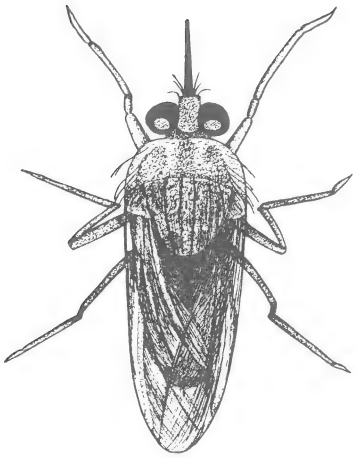
Malarial mosquito

If you should feel an attack of influenza within the first week or so of returning from a malaria area assume it is malaria until your doctor takes a blood smear and clears you. Caught early malaria need not be serious but sometimes doctors fail to recognise the symptoms causing some victims to become critically ill with cerebral malaria. (Pregnant women should avoid malarial areas).

The genus of mosquito which carries the malarial parasite is *Anopheles* and it is common in the lower-lying regions but extremely rare (probably just a vagrant carried in by car and train) on the inland plateau.

A handy mosquito repellent is smouldering elephant or cattle dung. A handy anti-itch remedy — onion juice (including wild onion) rubbed on the bite.

TSETSE FLY: There is no sleeping sickness in South Africa although the tsetse fly which carries the sleeping sickness trypanosome is abundant in Northern Zululand. The area to be wary of is the Okavango Delta in Botswana where the fly is common and a form of sleeping sickness a threat. There are however very few cases a year and the disease is treatable.



Tsetse fly

Africa has two types of sleeping sickness – that which is caused by the trypanosome *Trypanosoma gambiense* (the worst kind) in Central Africa and that which is caused by *T. rhodesiense* which is the strain found in southern Africa. Both are caused by a tsetse fly, a heavy scissor-winged insect larger than the European horse fly. I have found these flies (*Glossina morsitans*) tend to give a fairly sharp sting and then, if left, a "red hot" sting which somebody described as like a "red hot gramophone needle".

There are spray-on repellents which keep them away.

BITES AND STINGS GENERALLY: An interesting new development in the treatment of insect bites and, particularly, snake bites is a kit called *Aspivenin*. It is a mechanical suction syringe which is said to effectively draw out a significant proportion of venom from a wound. This small plastic vacuum-pump would be strictly a first aid measure but it has been found effective on bee stings and mosquito bites.

Snakes

The animal which people fear the most, inland at any rate, is the snake. Of the 160 species and sub-species in southern Africa 16 are potentially deadly. Many snakes which are viewed with awe are in fact relatively harmless. The night adder, for instance, has venom sacs which are about a third of its body length but the snake, extremely common in South Africa, has killed nobody. Anti-venom from a snakebite kit is in fact more dangerous than the snake's bite.

It is as well to note that the usual polyvalent snakebite kit is good against all snakes except the boomslang and black mamba. The former's bite is almost certainly fatal unless treatment is started within 2 or 3 days. The black mamba requires instant treatment and at least six phials of serum. The usual kit has two.

Generally speaking there are two major types of snakes – adders and elapids (cobras). The adders are chunky snakes with obvious tails

and with a venom which coagulates the blood and causes intense local pain; the elapids are thinner, longer and have a nerve poison. But some cobras can grow quite thick. Generally cobras rear up – they can stand on a third of their length – and spread a flattened hood. Even the mamba has a long though not too obvious hood.

Snakebite is a rare phenomenon. A lethal bite is very rare indeed. During World War 2 General Smuts, realising he would be posting thousands of men through snake-infested territories right up to Algiers had a team of four men catching snakes in the Eastern Transvaal and preparing anti-venom from their venom. At the end of the war a check revealed only seven cases of snakebite in the South African Army between 1939 and 1945. All seven involved the four men who had been catching snakes.

When walking in the veld it is best to wear shoes (snakes, having no ears rely on picking up vibrations from the ground via the rib cage) and long trousers or gaters. Step on logs first rather than step straight over them. If you are crawling on the ground and you come "nose to nose" with a snake blow gently into its face. It should then withdraw and go away.

Bear in mind most snakes are harmless and that even those which are poisonous will seldom inflict a fatal bite.

TREATMENT: Relax the patient. The less he moves the more slowly will the venom be transported around the body. If the bite is low down (ankle height) and causes intense local pain and, perhaps discoloration, you are faced with an adder bite. Adder bite symptoms are persistent bleeding from puncture marks, bleeding gums and bruises in various parts of the body. Shock is usually present in all severe bites. With adders there is sometimes vomiting and sweating. Only two adders are really dangerous – the gaboon adder and the puff-adder. (The 'Berg adder gives one a bad time but is almost never lethal). In the case of a gaboon bite begin treatment immediately – all anti-venom should preferably be injected intravenously (IV). With puff-adders you usually have more time – 12 hours or more before really life-threatened effects appear, although I recall a case at the Transvaal Snake Park where a young woman died within 10 minutes. But I believe that was heart failure due to fear.

Ninety percent of bites in southern Africa are from puff-adders. Whatever else you do NEVER be tempted to use a tourniquet with an adder bite. A pressure bandage (which is explained later) would be fine.

In the case of cobras and mambas (elapids) the symptoms are disturbed vision, "wooziness", slurred speech, heavy eyelids, difficulty in breathing as muscles begin to fail, coma and paralysis.

In all cases of venomous snakebites get the patient to hospital as soon as possible. In his book "First-Aid — Anywhere, Anytime" (The Pharmaceutical Society of South Africa 1987) Cyril Tucker deliberately avoids discussing the use of anti-venom because he considers it too dangerous for a lay person to use. There is almost always time, he says, to get a person to somebody qualified to inject anti-venom effectively.

This is true but in this book we are considering areas which are remote and where there is a possibility of an expedition being immobilised days away from professional help. I feel that any expedition going into a remote area should appoint one of its members to receive detailed instruction on how to give an IV shot and to acquaint himself with the general treatment of snakebite. As I have said, the chances of being bitten are statistically remote — but why chance it?

SNAKE BITE KITS: Most outdoorsmen prefer the conventional kits which ideally should be stored in a refrigerator or at least in a cool place. Ampoules whose contents have turned milky or have discoloured should be replaced. But be warned, Dennis Groves (the first director of the Transvaal Snake Park) was, as a youth, bitten by a rinkhals at his home in Germiston and, because his anti-serum was old and discoloured he drove himself to the old Johannesburg General Hospital where they had no anti-serum! They drove him home in an ambulance and injected him with his "time-expired" stuff! It worked. As recently as the 1970s The Star recorded the case of a Transvaal farmer who was bitten by a black mamba and driven to a doctor who was not sure what to do — so he sent him to hospital. By the time the man reached hospital he was beyond help.

There are three lessons here:

(1) never assume all doctors and nurses are competent to deal with snakebite;

(2) if you are visiting a remote but high risk area (the bushveld and tropical regions) take your own snakebite kit;

(3) old serum is better than none.

On an expedition the man assigned as "health officer" should be responsible for checking the contents of the snakebite kit. A bought kit may not contain a crepe pressure bandage — so add one.

Dr. J.J. Brossy formerly of Johannesburg who had a great deal of experience treating snakebite also subscribes to the belief that lay persons should not try to give IV injections of anti-serum and points out that troops in the former Rhodesia Army in the 1970s bush war never carried serum — they carried cortisone instead. Cortisone slows down the effects of venom long enough to get the victim to professional help.

Dr. Brossy's general advice is to reassure the patient and move him or her only after 15 to 30 minutes. This gives you time to assess the problems and for everybody to calm down.

He says "antihistamines can ALWAYS be given as they have no harmful effect but can be usefully sedative". "Anti-venine (another name for anti-serum or anti-venom) is highly effective when given intravenously even after a long interval", says Dr. Brossy – so *if you are using anti-serum and you are uncertain of your competency then keep at least half your supply until you can find a qualified person to inject it intravenously.*

"Cortisone", says Brossy, "is important for treatment of snakebite and for treatment of anti-serum allergy reactions. It has no immediate disadvantages but should be used only if symptoms of poisoning appear. And it should be used in all cases where anti-venine is injected".

Remember that children and small people need just as much anti-serum as large people for the simple reason they receive just as much snake venom.

In the case of puff-adder bites there can be large scale tissue damage around the wound – remember that anti-serum neutralises only the general effect but does nothing for the cytotoxic effect (local). Cortisone will ease the latter.

THE COMPREHENSIVE SNAKEBITE KIT: Bearing in mind the chances of coming across doctors or hospital staff who are incompetent to deal with snakebite in remoter areas of Africa my advice is that one should carry a comprehensive snakebite kit. Naturally I am not proposing this for basic survival kit for people travelling on foot, but for safari operators it would seem sensible.

Dr. J.J. Brossy proposes the following kit:

(1) 2 x 10ml syringes, 2 x 0,80 x 38mm needles (21 gauge).

(2) 2 x 5ml syringes, 2 x 0,70 x 38mm needles (22 gauge).

(3) 2 x 2ml syringes, 2 x 0,60 x 25mm needles (23 gauge).

(4) 6 ampoules of anti-serum.

(5) 6 ampoules of cortisone (hydrocortisone 100mg) or better 2 amps of a more concentrated form.

(6) 4 amps antihistamine for IV or IM (intramuscular) injection.

(7) Pethidine and/or Omnopon for pain (2 amps).

(8) Adrenalin in 1 000 solution (2 amps).

(9) Cotton-wool and skin antiseptic (meths say).

(10) Eye bath (for washing eyes in cases of spitting snakes).

(11) Injectable antibiotic.

To this I would add a pressure bandage — crepe being best.

NB:Items 7 and 8 must be used only by a trained person. 1ml equals 1 cubic centimetre.

The black mamba

COBRA BITES:

(1) Test for serum sensitivity by injecting one drop of anti-venine into forearm skin. If angry red patch appears before 20 minutes patient is sensitive.

(2) In cases of sensitivity and if snake bite is causing serious effects give large dose (2-4 ampoules) of cortisone before injection of anti-venom.

(3) If no allergic reaction, keep patient relaxed and inject 2ml of antihistamine IV or IM (IM = intra-muscularly).

(4) Inject 2 ampoules cortisone IV or IM.

(5) Inject 20ml (2 ampoules) anti-venine IV. If you don't know how then inject IM keeping the rest for a trained person to inject IV.

(6) Be prepared for resuscitation and removal to doctor.

(7) *If patient is sensitive* (shock sets in, victim becomes cold, clammy, sweaty, faint pulse) do the following:

(a) Inject all cortisone you have left IV or IM.

(b) Another 2ml of antihistamine (IV if possible).

(c) 0,25 - 0,5ml adrenalin *INTRAMUSCULARLY*, not *IV* but only if patient is critical. Repeat if on point of death.

(d) Pethidine 100mg will relieve pain and calm the patient. If patient responds more anti-venine can be given. In the case of black mamba at least six ampoules are necessary. "As many as 30 have been required!" says Brossy. The green mamba is not nearly as dangerous as black mamba — but it has a lethal bite.

If you have no pressure bandage to wrap around the bitten limb in the case of a cobra/mamba bite then use a tourniquet. Tie it between the bite and the heart. Remove it after 30 minutes for five minutes then re-apply for 20 minutes. Then discard it.

The puff adder

PUFF-ADDER BITES:

This is the snake responsible for most fatalities. *Use no tourniquet, make no incisions and use no antiseptics on the wound*. A pressure bandage should be used.

(1) Check for sensitivity (by injecting drop of anti-venom into forearm).

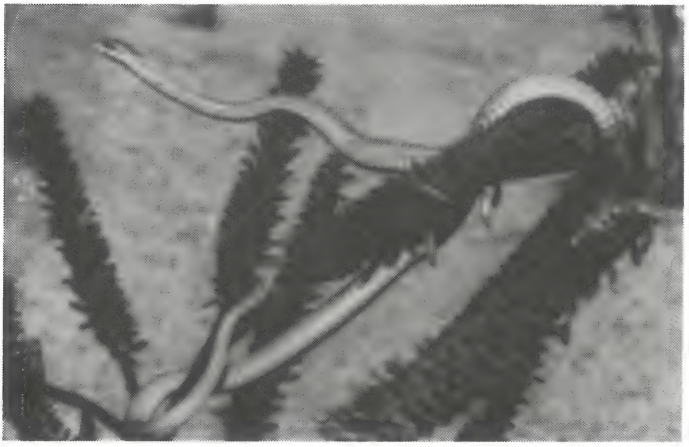
(2) While waiting for allergic reaction (20 minutes) inject 2ml antihistamine in the upper outer buttock.

(3) If definitely puff-adder inject 10ml anti-venine around but not in swollen bite site.

(4) When symptoms appear (sometimes there are no serious symptoms) inject 20ml (2 ampoules) intravenously or if you are not trained to do this then inject one ampoule and save the other for IV injection by a doctor.

(5) Give 2 ampoules of cortisone.

(6) If rapid deterioration after giving anti-venine then the patient is sensitive — so give all remaining cortisone (at least 4-6 ampoules of hydrocortisone — but up to 20 can be given in emergency). Another 2ml antihistamine and 0,25 - 0,5ml adrenaline intramuscularly but *only if patient is critical*. Pethidine (or Omnopon) is useful against pain. Adder bites are very painful.



The boomslang

BOOMSLANG BITES:

Bites from this non-aggressive, black-fanged snake are rare but the haemotoxic venom will kill.

Special anti-venine is needed and is obtainable only from SA Institute for Medical Research in Johannesburg. Telephone (011) 724-1781. Supplies can be dropped anywhere in Africa in 12 hours. Treatment even 3 days after the bite is effective but get patient to hospital quickly. Interim blood transfusion may be necessary.

VENOM IN EYES:

The rinkhals

Wash eyes out with water or any bland liquid -- even urine if nothing else is available. One part anti-venine to 10 of water is best. Seek medical care.

PRESSURE BANDAGE:

Johan Marais ("Snake versus man" -- Macmillan 1986) argues against the use of a tourniquet under *any* circumstance because they can be dangerous if left on too long, and painful. He advocates pressure bandages. The advice is widely accepted.

(1)Apply firm pressure to the site of the bite immediately with hand.

(2)Wrap the affected limb firmly, using a general-purpose bandage (crepe bandage is ideal but clothing torn in strips also works). He says: "You are not trying to cut off blood circulation, but rather to prevent venom from spreading rapidly through lymphatic system. The bandage should be as tight as for a sprained ankle".

You can leave the pressure bandage on indefinitely. It can be used for cobra *and* adder bites.

SNAKE RECOGNITION:

A good inexpensive book for snake identification and snakebite treatment is Marais' book mentioned above. Also excellent is RM Isemonger's Snakes of Africa (Books of Africa) and Snakes and Snakebite by Visser and Chapman (Purnell).

The distribution of venomous snakes

Area	Puff-adder	Gaboon-adder	Night-adder	Burrowing-adder	Berg-adder	Horned-adder	Cape cobra	Egyptian cobra	Spitting cobra	Rinkals	Black mamba	Green mamba	Boomslang	Bird snake (Twig or Vine)
N Transvaal	x	-	x	-	-	-	-	x	x	-	x	-	x	x
NE Transvaal	x	-	x	-	x	-	-	x	x	-	x	-	x	x
NW Transvaal	x	-	-	-	-	-	-	x	x	-	x	-	x	x
S Transvaal	x	-	x	-	-	-	x	-	-	x	-	-	x	-
SW Transvaal	x	-	-	-	-	-	-	-	-	-	-	-	x	-
SE Transvaal	x	-	x	-	-	-	-	-	-	-	-	-	x	-
E Transvaal	x	-	x	-	-	-	-	x	x	-	x	-	x	x
W Transvaal	x	-	-	-	-	-	-	x	x	-	-	-	x	x
N Natal	x	x	x	-	-	-	-	x	x	-	x	-	-	-
NW Natal	x	-	x	-	-	-	-	-	-	-	-	-	-	-
NE Natal	x	x	x	-	-	-	-	x	x	-	x	x	x	x
S Natal	x	-	x	-	-	-	-	-	x	-	-	-	-	-
SW Natal	x	-	x	-	-	-	-	-	-	x	-	-	-	-
SE Natal	x	-	x	-	-	-	-	-	x	-	-	x	x	x
E Natal	x	-	x	-	-	-	-	-	x	-	x	-	-	-
W Natal	x	-	x	-	-	-	-	-	-	x	-	-	-	-
N Cape	x	-	-	-	-	-	x	-	-	-	-	-	-	-
NW Cape	-	-	-	-	-	-	x	-	-	-	-	-	-	-
N Mid Cape	-	-	-	-	-	-	x	-	-	-	-	-	-	-
S Cape	x	-	x	-	x	-	x	-	-	x	-	-	x	-
SW Cape	x	-	-	-	x	-	x	-	-	x	-	-	x	-
SE Cape	x	-	x	-	x	-	x	-	-	x	-	-	x	-
E Cape	x	-	x	-	x	-	x	-	-	x	-	-	x	-
W Cape	-	-	-	-	-	-	x	-	x	-	-	-	-	-
N OFS	x	-	x	-	-	-	-	-	-	x	-	-	-	-
S OFS	x	-	-	-	-	-	-	-	-	x	-	-	-	-
N SWA	x	-	-	-	-	-	-	x	x	-	x	-	x	x
N Mid SWA	x	-	-	-	-	-	-	x	x	-	x	-	x	x
NE SWA	-	-	-	-	-	-	-	x	-	-	-	-	-	-

From "First Aid — Anywhere Anytime" by Cyril Tucker.

Area	Puff-adder	Gaboon-adder	Night-adder	Burrowing-adder	Berg-adder	Horned-adder	Cape cobra	Egyptian cobra	Spitting cobra	Rinkals	Black mamba	Green mamba	Boomslang	Bird snake (Twig or Vine)
Snakes														
NW SWA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S SWA	-	-	-	-	-	-	X	-	X	-	-	-	-	-
SE SWA	-	-	-	-	-	-	X	-	-	-	-	-	-	-
SW SWA	-	-	-	-	-	-	X	-	X	-	-	-	-	-
E SWA	-	-	-	-	-	-	-	-	-	-	-	-	-	-
W SWA	-	-	-	-	-	-	X	-	-	-	-	-	-	-
Mid SWA	X	-	-	-	-	-	X	-	-	-	X	-	-	-
N Zimbabwe	X	-	-	X	X	-	-	X	X	-	X	-	X	X
S Zimbabwe	X	-	-	X	-	-	-	X	X	-	X	-	X	X
E Zimbabwe	X	X	X	X	-	-	-	X	X	X	X	X	X	X
W Zimbabwe	X	-	X	-	-	-	-	X	X	-	X	-	X	-
Mozambique	X	X	X	X	-	-	-	X	X	-	X	X	X	X
N Botswana	X	-	X	-	-	-	-	X	X	-	-	-	-	-
NE Botswana	-	-	-	-	-	-	-	X	X	-	X	-	-	-
NW Botswana	X	-	-	-	-	-	-	X	-	-	-	-	X	-
SE Botswana	-	-	-	-	-	X	-	X	-	-	-	-	-	-
E Botswana	-	-	-	X	-	X	-	X	X	-	X	-	-	X
W Botswana	-	-	-	-	-	X	-	-	-	-	-	-	-	-
S Botswana	-	-	-	-	-	X	X	-	-	-	-	-	-	-

From "First Aid — Anywhere Anytime" by Cyril Tucker.

Chapter Eight

Staying healthy

"All you really need are some pills for constipation and pills for diarrhoea".

Gordon Vorster

Artist and desert wanderer Gordon Vorster's advice (above) was only half in jest. On the other hand why spoil a good trip for want of a small bag of tricks? Band Aid strips are useful for blisters and irritating cuts and take up little space, so why not take them? And take aspirin along too. And a couple of diagrams to remind you where the body's pressure points are and how to resuscitate a man with cardiac arrest and how to apply a splint ... No, there's no doubt, a medical kit is important.

If one is travelling in a bush vehicle then it makes sense to take a comprehensive medical kit. If you are on foot, stick to your survival kit outlined in chapter one.

In an accident there is a set pattern of action.

(1) Restore breathing.

(2) Stop bleeding (1 and 2 should be done together if possible).

(3) Cover wounds and burns.

(4) Set fractures.

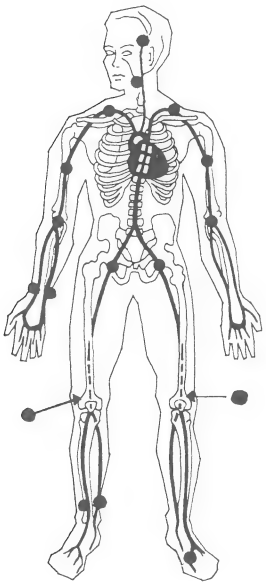
(5) Treat for shock.

It is impossible, within the scope of this book, to cover all aspects of first-aid and an obvious precaution is for you to buy an inexpensive booklet on first-aid. There are plenty of them.

The average person could lose 0,5 litres of blood (about 1 pint) without much discomfort. The loss of a litre (2 pints) — a sixth of one's supply — would bring on dizziness, rapid pulse and an increased breathing rate. The loss of 1,5 litres would cause shock and beyond that it can be critical. Technically speaking "shock" is the loss of blood. Drinking water in gradual doses is a vital part of the treatment because the patient will need it to help the body manufacture fresh blood.

There are various types of bleeding. If blood oozes from a wound then it is the capillaries that are damaged. Such wounds are not dangerous unless infected. If dark blood flows from an injury then it is a vein which is damaged – veins return slightly blueish de-oxygenated blood to the heart. If bright red blood spurts from a wound in time with the pulse then it is an artery which is severed.

Your first action if an artery is severed is to apply pressure on the wound preferably with a sterile cloth, but that's not always possible. Use pressure from your hand or finger while searching for a cloth. Now bandage over the pressure pad. Put another bandage over the first if blood continues to soak through. If the limb is not broken elevate it above the heart – this reduces the heart's pumping pressure in the artery a little. If bleeding is still bad find the nearest pressure point (the body has several – see illustration) where arteries are near the surface and can be pressed against bone thus regulating the flow of blood to the site of the wound. But do this only if the bleeding is showing no signs of stopping.



Pressure points

Don't remove the dressing once it is in place but loosen it if you see that the victim's lower limb, or fingers or toes are turning blue.

It is now widely recognised that tourniquets are dangerous and are an absolute "last resort". They can if incorrectly applied actually increase blood loss and they can cause irreparable nerve damage and gangrene.

Nevertheless, if you have to use one then remember a tourniquet is ideally made from 50-100mm (2-4 inch) bandage and is tied a hand's width above the wound (between the wound and the heart) but, if you can, place a pad (a folded handkerchief perhaps) over the artery before wrapping the tourniquet around.

Two turns of the tourniquet will be enough. Tie the two ends around a stick and use the stick as a handle to tighten or loosen the tourniquet. If you are treating your own injury then secure the stick so that the tourniquet will remain tight should you go into shock. If you are treating somebody else loosen the tourniquet every 10 minutes for a couple of minutes.

With all open wounds try to adopt a sterile technique. It is very important. Wash your hands, gently wash the wound – obviously this is best done with water which has been boiled. On the southern African plateau you would have to boil water for at least 9 minutes to sterilize it. Three minutes is enough at sea level. You add an extra minute for each 300m (100ft).

The authors of "How to Survive on Land and Sea" recommend benzalkonium chloride as the best antiseptic but soap is also fine and even fresh urine (which is sterile by the way) can be used as an antiseptic. But rather wash the wound itself with cool water which has been boiled and use the antiseptic for cleaning up around the wound.

Incidentally maggots will help keep a wound clean.

A useful item in a comprehensive first-aid kit is a haemostat, a scissors-like, self-locking instrument which can clamp arteries and can also be used to grip needles when sewing up a wound. You can buy adhesive "butterfly sutures" for taping across an open wound instead of having to stitch it. Stitching is easy and it is best. A scalpel is useful too – for cutting away dead flesh (essential before dressing a wound) and tweezers may be needed for removing foreign bodies.

Remove any dressing if you detect an offensive smell or if the patient complains of throbbing – a sign of infection. In the case of a bad infection apply a poultice from almost anything that can be boiled in a small cloth bag which is then, once it has cooled down enough, applied to the wound. Even a heated stone in a cloth is better than nothing. Don't risk burning or scalding the skin.

Boil all dressings for at least 15 minutes before re-using.

There are two common fractures – those which result in a bone breaking the skin and protruding and those which do not.

The first priority in treating a fractured limb is to set the bone. You may have to stretch the limb until you can click the bone ends together. Then immobilise the limb. You can set your own fractured leg by first preparing the padding and the splint and ensuring these are within easy reach. Then wedge your foot in a tree fork or between two rocks and pull on it. If necessary you will have to let the weight of your body stretch the limb until you feel the bone click into place. Then you pad the leg and splint it.

Anybody setting out on a venture where there is a risk of serious injury in a remote area would be irresponsible not to acquaint himself with first-aid practices regarding fractures and a photostat of various types of limb splinting and slings is a vital part of a medical kit.

In cases where a victim's breathing has ceased use mouth to mouth resuscitation which is done by placing the victim on his back, placing padding under the neck so that the head tilts back, and then, taking a lungful of air, you place your mouth over the victim's open mouth and blow air into his lungs. You will know if you are doing it right because the victim's chest will rise. Now take another lungful of fresh air and repeat until he is breathing independently.

Cardio-Pulmonary Resuscitation

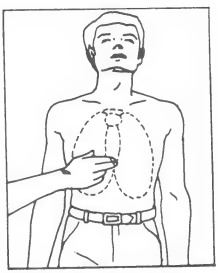


Figure 29: *Find the notch at the tip of the breast bone*

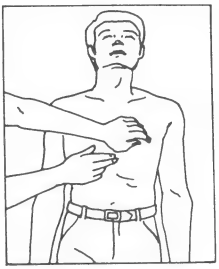


Figure 30: *Measure up 2 fingers*

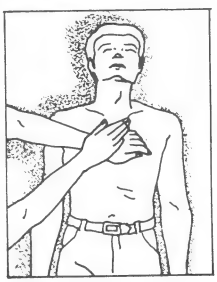


Figure 31: *Place the heel of the other hand on top of the first hand*

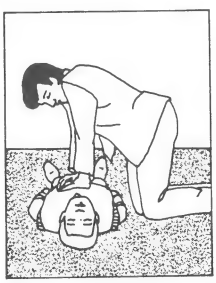


Figure 32: *Press straight down, using a rocking motion. This is CPR*

From "First Aid — Anywhere Anytime" by Cyril Tucker.

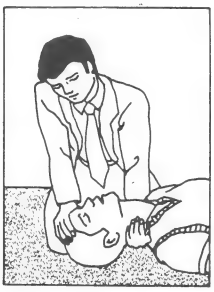


Figure 25: *The first step in opening the airway*

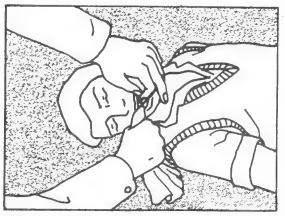


Figure 26: *The second step is to clear the throat of any foreign bodies*

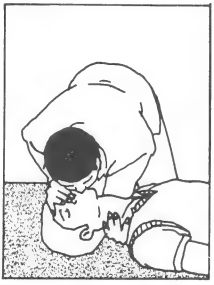


Figure 27: *Mouth-to-mouth resuscitation*

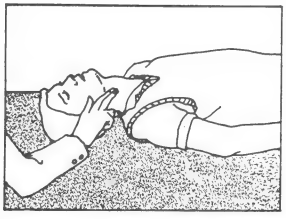


Figure 28: *Check the carotid pulse*

From "First Aid — Anywhere Anytime" by Cyril Tucker.

Effects of the sun

It is important to wear a hat in Africa. I describe in the chapter on "water" how to improvise an Arab burnous which is a sensible headgear for arid regions. It is also important to protect the eyes from glare. North American Indians, to avoid snow-blindness, rub charcoal around their eyes and cheek bones. This also helps reduce the effects of desert glare. One can of course wear sunglasses or even improvise a pair by piercing two narrow eye-slits the length and thickness of half a match in a cardboard or bark mask.

GLARE BLINDNESS: keep victims in total darkness, cover the eyes with a dressing and give aspirin.

HEATSTROKE: is a potentially fatal condition. It must be treated immediately the symptoms are recognised. The skin becomes hot and dry to the touch, sweating ceases, the pulse becomes rapid and the body temperature rises. The victim may behave irrationally, may vomit and complain of a severe headache before losing consciousness. He must be placed in the shade and stripped down to underwear and his skin constantly sprinkled with water and fanned with anything available. The idea is to create rapid evaporation on the skin surface to draw off heat. Allow for natural ventilation and, when conscious, get him to drink plenty of water (a little at a time). Only if it seems the patient might die should you immerse him in water and even then very gradually as it may cause his deep internal temperature to climb with fatal results. Be ready to cover him when he becomes over-cool but expect his temperature to fluctuate widely for some time. Be prepared to give the patient cardiopulmonary resuscitation – that is mouth to mouth resuscitation AND cardiac compression. Elevate the victim's head and shoulders slightly.

HEAT EXHAUSTION: (body temperature normal, skin clammy, weak pulse, pale about the face) the victim should lie in the shade with the legs slightly elevated. The patient should be cooled as with heatstroke and given a little salt – a pinch of salt per litre (2 pts) plus ascorbic acid or citrus fruit.

SUNBURN: lay the patient down in the shade and place damp cloth on his skin. Try to bring temperature down. The juice of aloes on the skin is supposed to help. Sunburn can cause painful cracking of the lips and some people carry "Lip-ice" when in the desert or semi-desert. Another popular remedy is Anthical which comes in tubes.

Clothing

The hot and dry conditions in southern Africa call for a definite design in some items of clothing. A hat is essential but a hat with a brim which shades the back of the neck and the eyes. The traditional scout hat seems to me ideal but it has noticeably gone out of fashion in favour of the "floppy" bush hat which is more comfortable.

You need fairly strong clothing because of the nature of the bush and its thorns. Synthetic material is not ideal in the heat. Cotton is best. Shirts should be long sleeved for protection against the sun and biting insects. Long, lightweight trousers are better than shorts giving protection against vegetation, insects and, for the nervous, against snakes. Woollen socks are more comfortable than nylon ones but they collect burrs which can be irritating and difficult to extract. A number of rangers I know do not

wear socks but unless you have very tough feet you'll end up with blisters.

Keep boots well polished and "Dubbined" and they will last years. Most hikers consider boots only just broken in after 150 to 200km. When they get wet let them dry naturally — not in front of the fire.

If you feel a blister starting or detect any red spots use a zinc oxide plaster immediately. Don't wait for the blister to form and if it does don't lance it. Band Aid strips are also fine for blisters. Talcum in your socks helps prevent blisters.

Food

Good "survival food" would include biltong, dried fruit, nuts and glucose. Tea weighs so little and is such an excellent thirst-quencher that it is worth taking.

If you have to live a long time on a sparse diet you may suffer vitamin deficiencies.

- Vitamin A deficiency is characterised by loss of night vision and physical weakness. It can lead to blindness. It is obtainable from yellow fruits and vegetables, egg yolk, liver and fish.

- Lack of Vitamin B causes lethargy, headaches and can lead to beriberi which affects the nerves, digestive system and heart. You get it from egg yolks, grains and lean meat.

- Lack of Vitamin B2 (riboflavin) affects the digestive system and is had from much the same sources as B.

- Vitamin C deficiency results in scurvy, lethargy, irritability, sore joints, nose bleed and loosening of the teeth. Citrus fruit, green vegetables and several common herbs can reverse this.

- Green grass contains Vitamins A, B and C but cooking the grass would destroy the vitamins. Drop it into a stew just before you eat it.

- Vitamin D deficiency causes rickets. Source: Sunlight (on the skin which manufactures Vitamin D) and liver oil.

Ailments

CONSTIPATION: rarely serious. Lots of liquid helps and stand rather than sit. Dried fruit helps.

DEHYDRATION: loss of body fluid through diarrhoea, vomiting, lack of water. This leads to dizziness, tingling of skin. Only remedy is copious water but no alcohol or salt water.

DYSENTRY: the best way to avoid it is to boil all water or use an efficient filter (see chapter on water). Best treatment – sterilise all eating and drinking utensils. Boil all water, eat solid starchy foods such as cooked roots and even bark.

EXHAUSTION: Aspirin and sleep. Eat, not too much but quite often, especially sweets and nutritious liquids.

FISH HOOKS: if a fish hook becomes caught in somebody's skin, snip-off eyelet (this is where latest Swiss Army Officer's knife is so useful – it has wire cutters) and push the hook all the way through – barb first.

ALCOHOL – alcohol is of little use for survival except as a fire-starter maybe, or an antiseptic or for pouring on the body to cool the skin. It is useless for quenching thirst because, for every sip of alcohol, your body will use up the equivalent of two or three to process the alcohol through your system.

HYPOTHERMIA: this is the lowering of the body temperature to the point where victim is indifferent to surroundings or risk. Often accompanied by violent trembling, loss of co-ordination. Get patient out of wet clothes and into warm dry ones. A foil blanket ("space blanket") will help but in some cases it may be necessary to strip the victim and place between two people who are warm. If naked, heat transfer is more efficient. When temperature is restored the patient must still be watched carefully – until he is able to generate heat.

POISONING: fresh white ash from hardwood fire mixed with water is an antidote. One authority recommends powdered charcoal from camp fire but the former would be better.

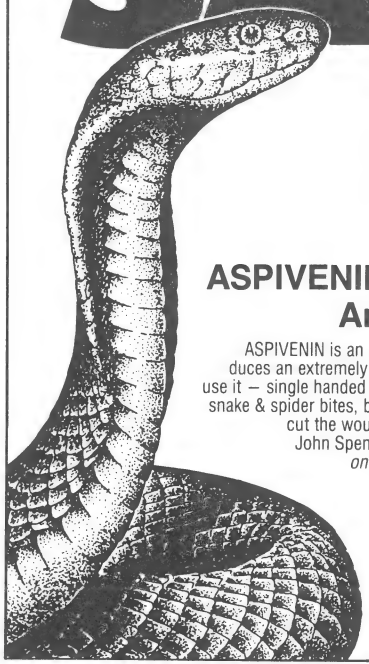
SALT: most survival books advocate salt tablets are essential in a survival kit, but over the last decade salt has been discredited as a medicine. In a celebrated experiment carried out on 18 South African marathon runners a medical team discovered that notwithstanding the loss of salt during the race (in hot weather) the runner's blood levels at the finish showed normal salt levels and even higher than normal.

"The SAS Survival Handbook" recommends salt in cases of heat cramps (an early sign of heat exhaustion which is often accompanied by dizziness, vomiting and shallow breathing): "Move to shade. Rest. Drink water with a little salt dissolved in it – only a pinch to half a litre (pint)". It also recommends salt for heat exhaustion. Medical opinion is divided.

But the SAS handbook's advice is hardly going to do damage. Taking salt tablets seems widely condemned.

SAP IN EYE: if you get euphorbia sap in your eye (from naboom, candelabra tree or umThombothi or tamboti) serious inflammation can result. Irrigate eye with water or blink them under water. Even urinating in the victim's eyes will be better than nothing. If foreign objects is lodged in the eye place wet pad over it and bandage it in place.

THIS COULD SAVE YOUR LIFE!



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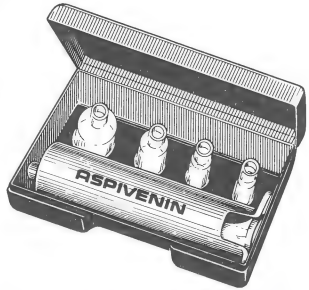


ASPIVENIN

I.D. CAMERON-WHITE & ASSOCIATES

Chapter Nine

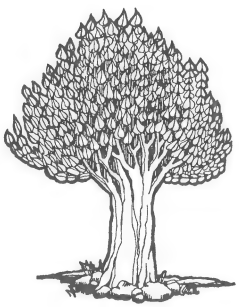
Fish for Life

"No man was born an artist nor an Angler"

Izaak Walton

There's no doubt fishing is an art and even ardent anglers who use hand-crafted rods, electronic bite detectors and other devices often go home disappointed. When it comes to survival one becomes more resourceful and less sporting. The point is that fish are highly nutritious and, well, very tasty.

One way of catching fish in fairly shallow water is to dump the crushed pieces of certain plants in the water in order to poison the fish. The fish float to the surface, usually after many hours, and are safe to eat. A popular plant used to "stun" fish is the Euphorbia – particularly *Euphorbia ingens* which is also known as the naboom, umHlonhlo (Zulu), mokgoro (Sotho), mukonde (Venda). Broken branches "bleed" a white latex which, dissolved in water, stuns the fish. *Croton megalobotrys* or the fever berry tree (umTua in Zimbabwe) which is common on the alluvial flats of southern Africa from the Limpopo into Central Africa has a bark which can be stripped and scattered in a pool. The crushed seeds of *Strychnos stuhlmanii* (black bitter berry) and the crushed pods of *Swartzia madagascariensis* (snake bean or, in Zimbabwe, muTserekese) also work. Both occur north of the Limpopo.



Euphorbia ingens

The bark and leaves of the visgifboom, *Mundulea sericea*, can be pounded into pulp, placed in a porous bag and dropped in a pool. The pulp can also be daubed or wrapped around a stone. The fish may take all day or all night to float to the surface.

A friend who has tried Euphorbia with success advises "Throw in as much as you can". Remember that using this method in an isolated pool will denude it of fish for perhaps years to come so do not use this method unless you are in dire straits.

In a shallow pool you would probably have luck using an improvised fishing spear – a 3 metre pole with a sharpened point. Better still, with a carved wooden barbed spearhead lashed to it. Even in a dried up pan you may be able to dig out barbel aestivating in the mud.

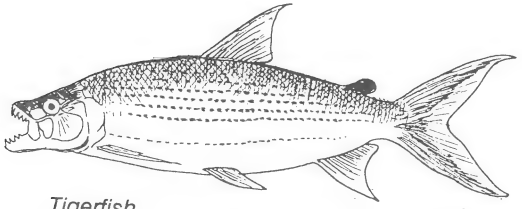
Eels, found only in east-flowing rivers in southern Africa are easily caught with a bundle of worms tied together and a snag at the end of the line just a few millimetres from the bait.

Fishing line and small hooks (big hooks only catch big fish while small hooks catch big and small) are essential in a survival kit. A couple of sinkers help too. Often the most difficult part of fishing is to find the bait but with ingenuity and, perhaps, groping around in the ooze one can find organisms big enough to impale on the hook. You don't need a rod, although it is usually easy enough to improvise one and it does enable you to cast the line well out in the deeper areas where, on a hot day, the fish will be keeping cool.

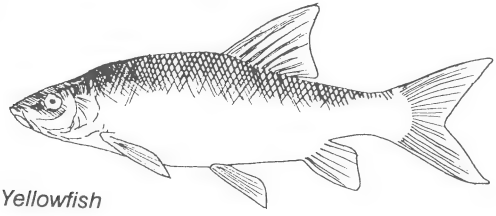
Snails and shellfish make excellent bait and, of course, any caterpillar or worm.

Late afternoon (4pm - 6.30pm) and (9am - 1pm) are the best times to fish. Look for where food particles drift. If you have no bait a piece of tin

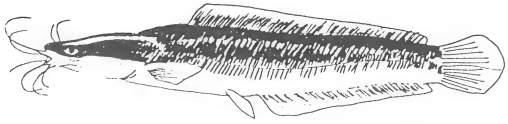
Freshwater fish



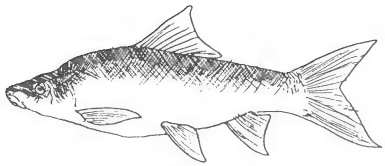
Tigerfish



Yellowfish



Barbel



Mudfish

or plastic which will spin in the water at the end of your line as you trawl it will attract fish. Stir up the mud first because then the fish cannot see so well and are more likely to snap at something slowly flashing by.

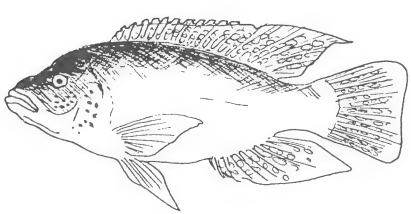
Once you have caught a fish cut it open and see what it has been eating. It will help you decide on bait. You can of course use its viscera as bait.

Stirring up fine mud causes fish to surface by clogging their gills – you may then be able to either spear them or club them. You can attract fish at night by shining a light on the water. In estuaries prawns also come to the surface drawn by light.

Fishes up to finger-length can be eaten whole and even raw if things are that bad. Larger ones need to be bled as soon as you land them (cut throat) their gills removed (these go bad first) and innards removed. Slit a fish open from its anus along its length to gut it. But you do not have to gut a freshwater fish if you are going to immediately put it on the fire.

The simplest way to cook a fish is to skewer it on a green stick and turn it over hot coals. Skin it or scale it after it has cooked. You can also grill it by making a green stick grill over the fire. Or (the best way) put it in the coals in tin foil or encased in mud. It can also be wrapped in green leaves.

Fishing line can be made from mother-in-law's tongue and from plants with similar long spear-shaped leaves which first must be scraped down to their fibres. The fibres can then be plaited adding a new fibre each time you get near to the end of one. A 4-fibre line 2 to 4 metres long should



Kurper

be long enough and will have a breaking strain strong enough for any freshwater fish you are likely to catch.

Along the African coast fish and shell fish are abundant and can be drawn by light. All caught on a line are likely to be edible – including the livers, roe, heart and blood.

Avoid sharks liver, it is usually highly poisonous. Shark's are the easiest fish to catch on a line. Don't store fish – eat them while fresh. But you can dry fish flesh and that will keep a few days. You can eat seaweed if you are desperate but it is difficult to digest and you will need lots of water for they absorb body fluid even more than fatty foods. When you drag it ashore look for shrimps in it.

Mussels, oysters, crayfish and crab are prolific along the rocks and are best eaten steamed or boiled. All are edible. Fresh water mussels are common in southern African rivers. You will find them finger-deep in soft mud which is about a hand's depth below the water. You can feel them out with your toes. They are high in protein and can be eaten raw, steamed or boiled for 10 minutes. You may find them in damp patches of dried up water courses.

Chapter Ten

The mountains

"Out of this nettle danger
we pluck this flower, safety".

William Shakespeare

Reg Pearse was one of the great men of South Africa's golden age of climbing. In that mid-20th century period, slowly and sometimes bloodily, the peaks of the Drakensberg fell one by one to mountaineers. Pearse reviews some of the worst tragedies in a compelling book called "Dragon's Wrath" (1986) the quotation heading this chapter was used in his book.

Pearse as much as anybody living knows how to survive in the mountains. He himself came perilously close to falling off the Drakensberg's great basalt wall and has seen many a broken body of those who were not so lucky.

What's his advice? Plan, he says. Carefully plan every climb.

To help you there are excellent 1:50 000 survey maps of all South Africa's mountain areas and most of Zimbabwe's. For your own safety it is essential that you fill in the Mountain Rescue Register at your point of entry to the 'Berg. All 'Berg hotels and Forestry and Natal Parks Board offices have them. And sign off when you come back. One party who failed to do so — or at least simply wrote "walk up Cathkin" — caused rescue workers (and the climbers' next of kin) days of anguish as searchers tried to find them. All three were found dead after many days.

A priority is to take warm clothing. Even in mid-summer where in the valley hotels the temperature can be 28 degrees C, on top the cold can descend like a theatre curtain, bringing blizzards out of what, an hour before, was a clear blue sky.

Cold wind can kill at 3 000m and two sleeping bags are more sensible than one. And always have a windbreaker jacket — preferably a down-filled anorak.

Have something dry to change into at night. A track suit is fine.

Climb, or scramble in boots, not soft shoes. And, to avoid blisters, wear two pairs of socks, "the inner (sock) thin and well soaped on the in-

side with soft shaving soap, and the outer thick-knitted with some talc powder between the two pairs", says Reg Pearse.

Dehydrated foods are better than heavy tins for obvious reasons and chocolate and extra oatmeal are good for emergencies. It is important to take more food than you need.

Pearse advises: "Make your first trip to the top an overnight stay – see how you feel sleeping at 3 000m before you plan a 10-day hike up there".

Along the 100km of the main escarpment – a precipitous wall with cliffs up to 600m high – there are only a dozen paths down to the valley. Get to know where they are, you might have to come down in a hurry. If it begins to snow steadily get down quickly. Climbers have died in the snow, usually hopelessly lost.

In the event of a mist, stay put. You can become disoriented and wander over the edge. If in the foothills (the Little Berg) follow a stream. It will finally cross under a road and all the streams flow eastwards.

If you are caught on top and the mist threatens to outlast your food supply then follow a stream westwards into Lesotho. The vehicle track from Butha-Butha to Mokhotlong runs parallel to the escarpment and you'll intercept it in a day or two. Vehicles use this track frequently.

The Basuto of the highlands have lately become suspicious and aggressive towards strangers and many mountaineers have been threatened and even robbed. One was recently murdered. Boots have been stolen under cover of darkness. The locals are particularly suspicious of people entering the country without passports and with firearms. Pearse says all climbers to the top should carry a passport. It makes sense.

Never go into the 'Berg alone says Pearse. And never go in with a party that is big. Three or four is ideal – one to remain behind should somebody become a casualty, the other(s) to fetch help.

Drakensberg rock is friable. Be careful on the edge but also be careful of dislodging the many boulders one comes across. If, accidentally, you do dislodge one, call loudly "Rock!" to warn others below.

Never camp beside a stream. In 1981 three youngsters were crushed to death when a wall of water caused by a storm kilometres away and of which the trio were probably totally unaware suddenly brought down an avalanche of boulders.

Lightning kills fairly often in the 'Berg which has some very dramatic storms. If you are on top of the escarpment the best thing to do is crouch down. Don't shelter under an isolated tree or crouch near a lone rock.

If you are on horseback dismount and distance yourself from the horse. At Injasuti two people and their dog standing on a promontary were killed recently by a rogue bolt of lightning.

South Africa loses several people a year in summer storms on its inland plateau, the worst being 61 in one go- all were in one hut. The safest place to be is in a car.

When people are struck artificial respiration can save them and prolonged resuscitation may be necessary.

Hypothermia is a killer in the high Drakensberg. This is a condition where one loses more heat than one is able to generate. (For treatment see chapter eight).

Take a good look

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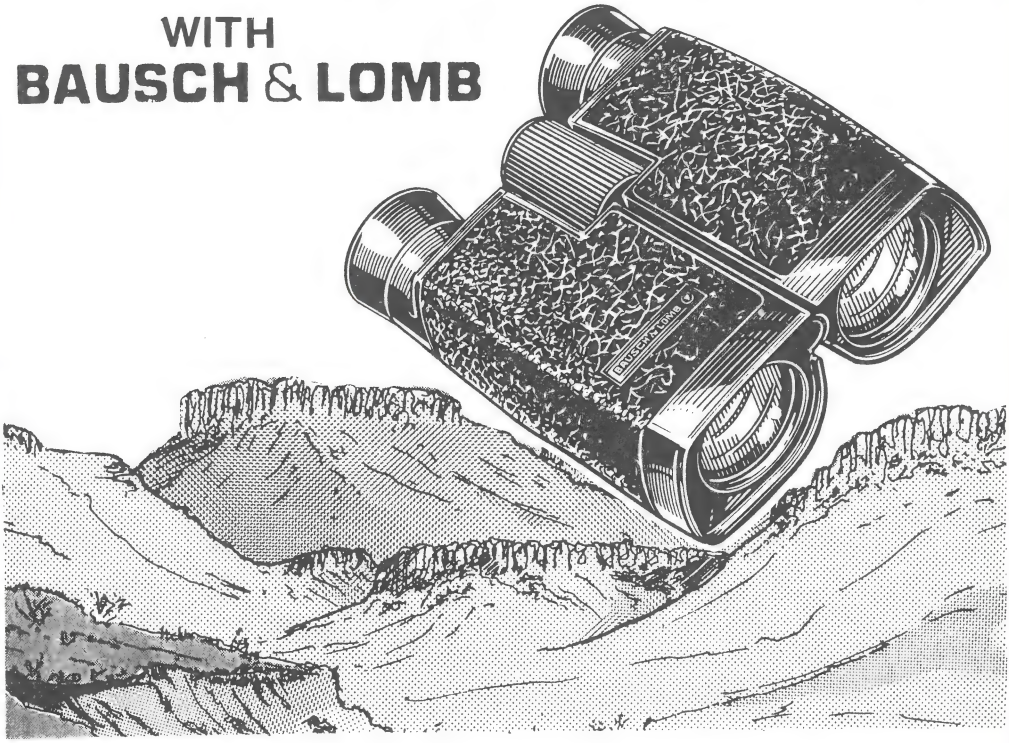

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Chapter Eleven

Cameras and binoculars

"The harvest of a quiet eye"

William Wordsworth

Cameras and binoculars, when it comes to survival, are usually the first pieces of equipment to be jettisoned. But nowadays both instruments are being designed to be lighter and more compact — and there's certainly no doubt that binoculars can be a useful survival tool.

Of the latter there are two types: the standard prism and the roof prism. The roof prism glasses are today so compact you can tuck them into your shirt pocket.

Quite apart from survival considerations what are the criteria for a good pair of binoculars? It depends why you want them. For general purposes I recommend 8 x 40. The first figure, incidentally, refers to the degree of magnification and the second to the width in millimetres across the large lenses. The wider these lenses the more brightly-lit will be the image. I have seen good 10 x 50 but they are, for general purposes, too big. You need glasses that are light, which fit into the hands comfortably and which you can hold steadily for minutes on end.

Cameras? There's no doubt that for "serious photography" one needs a selection of lenses and other equipment and most expeditions I can think of require "serious photography". That requires a whole bag of equipment. Otherwise, for general-purpose photography, one can buy lightweight compact cameras these days even down to the size of one's thumb.

Dave Paynter co-author with Wilf Nussey of "Kruger-Portrait of a National Park" advises: "shoot selectively". For the backpacker that advice is vital for, apart from the economy, it also means you need carry less film. He also advises: "Keep your camera handy" — don't pack it at the bottom of your kit.

Paynter's other tips:

(1) Dust, heat, moisture and vibration must be guarded against. Paynter wraps old (lintless) linen around his.

(2) Use an ultra violet filter as a dust cap – whatever you do don't rub dust off a lens, blow it off.

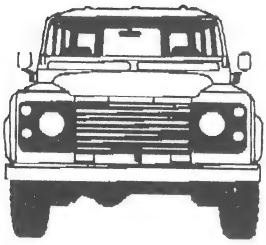
(3) Heat attacks the electronics of modern cameras and the film.

(4) Vibration – keep camera on the vehicle seat.

(5) Take fresh batteries for those with silver oxide or mercury batteries.

(6) Keep film as cool as possible. But if kept in a refrigerator remember to remove it an hour before use because of condensation.

Chapter Twelve



Vehicle first aid

"I like a road that leads away to prospects bright and fair,
A road that is an ordered road, like a Nun's evening prayer;
But best of all I love a road that leads to God knows where."

Charles Hanson Towne

Anybody who travels long and lonely distances into remote areas would be wise to keep a "car survival kit" in the boot. A kit containing a mess tin, fuel tablets or small stove, 2 lighters, basic food (water, tea, sugar, milk powder, chocolate and a couple of cans of meat and vegetables), a can-opener and spoon. If you anticipate traversing really remote areas then flares could be useful. A torch is essential in a car (reverse the top battery in case it is accidentally switched on).

A fire extinguisher is also essential – but keep it in the cab, not the boot.

Other essentials: tyre lever and puncture repair kit. Tyre pump, brake and clutch fluid, oil. Jump leads, coil of wire, radiator hoses, two spare fan belts. Carry spare bulbs, points, plugs, condensers, fuses and a regulator.

Crossing deserts usually entails marked variations between night and day temperatures which cause metal stress and this can cause oil, fuel or water leaks. *Check for leaks every morning*.

If your car overheats and you are not in a position to stop then, until you can stop, turn on the heater as this will draw extra heat off the engine. Open the bonnet as soon as you stop. If you have a radiator leak, an egg dropped in the radiator will block small holes – so will mealie meal. But don't remove the radiator cap until the engine has cooled down, otherwise you will just waste water. If the hole is too large to be blocked then crimp the copper pipe with pliers. Even though this will lessen the cooling system's area it will at least enable you to move.

If you need to winch yourself out of trouble but have no anchor point bury the spare wheel and winch against that.

When crossing arid areas it is best to fill silver wine bladders (the sort that come with boxed wine) with water. Once you are across you empty them and stow them away.

When in bush or desert filter all your fuel. Take spare filters for the air and fuel pump.

Remember that in a desert it is often difficult to use a jack on the soft sand – so carry a wide metal plate. You can buy bags which inflate from the exhaust pipe gases and so lift a car, but a plate is a better answer.

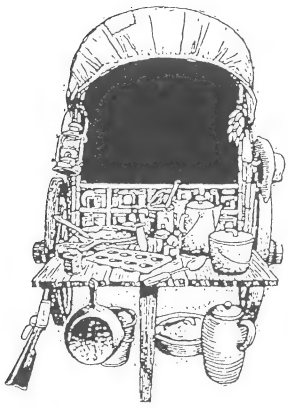
In case of a slipping clutch – usually resulting from an oil leak or grease – squirt a fire extinguisher through the inspection hole in your clutch housing. If you run out of clutch or brake fluid you can use almost any fluid (even urine) as long as you flush it out as soon as you can.

Always carry two extra fan belts. I once fitted a new spare and it snapped 300km later. You can improvise with a stocking, rope or tie but it is very difficult.

If your high tension lead goes between the coil and distributor you can use a willow twig or any similar moisture-laden stick and push it into the tight-fit holes which normally take the ends of the HP leads. But don't touch the lead when the engine is running - there's more than 1 000 volts pulsing through. It will quickly dry out. Replace it.

You can drive a car with a dead battery providing you can start it. In push-starting engage second gear.

If you have a puncture and no spare then pack the tyre with grass and anything else and drive slowly. Try to distribute the weight away from the corner which has the flat. In a four-wheel-drive vehicle should a half-shaft break and you have no spare, remove it, disconnect the drive and keep going on the other axle.



Chapter Thirteen

All purpose checklist

"Men are men;
the best sometimes forget."

William Shakespeare

Here is a checklist for outdoor living. It includes all basic items required for a caravanner, camper or back-packer. Obviously the back-packer is not going to set out with a bucket, broom and folding chair. I suggest he underlines his needs – they will all be on this list.

Preparations for going away

(1) Advise police.

(2) Arrange for care of pets, plants.

(3) Leave key with friend with request to occasionally turn house lights on. Disconnect appliances and if you are going to be away a long time, empty freezer and refrigerator.

(4) Stop paper, milk and mail deliveries and ask a neighbour to check daily.

(5) Turn off water.

(6) Turn off geysers (or at least turn them down).

Clothing

(7) Spare shoes (hiking boots).

(8) Rain gear (Wellingtons).

(9) Windbreakers/hat.

(10) Extra socks.

Personal

(11) Any personal medication.

(12) First-aid kit (see index).

(13) Survival kit (see index).

(14) Torch and spare batteries. Reverse first battery in torch in case it is accidentally switched on.

(15) Towels.

(16) Washbasin.

(17) Toiletries/shaving kit/toilet rolls.

(18) Matches/candles/2 lighters.

(19) Insect repellent.

Camping gear

(20) Tent/pegs/mallet/groundsheet.

(21) Canvas repair kit.

(22) Broom/bucket.

(23) Extra poles, rope.

(24) Axe/shovel.

(25) Line and clothes pegs.

(26) Fire extinguisher.

(27) Knife/sharpening stone.

(28) Tools including hammer/pliers/vicegrip/screwdriver.

(29) Lighting.

Bedding

(30) Air mattress/pump/repair kit.

(31) Sleeping bag/liner/pillow.

(32) Camp bed/legs.

(33) Blankets.

(34) Mosquito net.

Kitchen

(35) Basin/bucket.

(36) Stove/extra cylinder/fuel/charcoal.

(37) Cooking utensils: kettle/coffee pot/saucepan/frying pan/aluminium foil.

(38) Can-opener/cork screw/kitchen knife/knives, forks, spoons.

(39) Plastic food containers/plastic water bottle or empty silver wine bladders for water/thermos flask/cool bag.

(40) Funnel/measuring cap/mixing bowl/spatula/tongs.

(41) Mugs/disposable cups/plates.

(42) Napkins/paper towels.

(43) Plastic bags.

(44) Table/chairs/table cloth.

Food - basic

(45) Bread/butter/jam.

(46) Bacon/eggs.

(47) Cereals.

(48) Coffee/tea/cocoa.

(49) Sugar/salt/pepper/mustard.

(50) Powdered milk/fruit-drink powder.

(51) Rice/powdered potatoes/packets of soup/stock cubes.

(52) Tinned meat/vegetables/fish/fruit.

(53) Cooking oil/herbs/curry/sauces.

Other

(54) Notebooks/pens/stationery/stamps.

(55) Binoculars.

(56) Camera (plastic bags for protection)/film.

(57) Books/playing cards.

(58) Maps.

(59) Portable radio.

(60) Fishing tackle.

(61) Sunglasses.

(62) Swimming costume.

(63) Sewing kit/safety pins.

Papers, etc.

(64) Driving licence.

(65) Passport/ID card.

(66) Cheque book/credit cards.

Useful Books

Don't Die in the Bundu by Col. D.H. Grainger. Howard Timmins, Cape Town.

The SAS Survival Handbook by John Wiseman. Collins Harvill, London 1986.

How to Survive on Land and Sea by Frank C. Craighead and others, revised by Ray E. Smith and D. Shiras Jarvis. Airlife, Shrewsbury 1986.

The Survival Handbook by Michael Allaby. Macmillan, London 1984.

Outdoor Survival Skills by Larry Dean Olsen. Brigham Young University Press, Provo, Utah 1974.

Afoot in the Desert by Alonzo Pond. Maxwell Airforce Base Publication. Ala. 1974.

The South African Backpacker by Helmke Hennig. Certaur, Cape Town 1983.

Everyone's Guide to Trailing and Mountaineering in Southern Africa by Jaynee Levy. Struik, Cape Town 1985.

The Bundu Book Longmans Salisbury, Rhodesia 1971.

Food from the Veld by F.W. Fox and M.E. Norwood Young. Delta, Johannesburg 1982.

Trees of South Africa by Eve Palmer and Nora Pitman. Balkema, Cape Town 1972.

African Insect Life by S.H. Skaife and J. Ledger. Country Life, Johannesburg 1979.

Snake versus Man by Johan Marais. Macmillan 1986.

Dragon's Wrath by R.O. Pearse and James Byrom. Macmillan, Johannesburg 1986.

Man is the Prey by James Clarke. Andre Deutsch, London 1968.

Mountain Odyssey by James Clarke and David Coulson. Macmillan, Johannesburg and New York 1985.

Sea and Shore Dangers by Margaret Smith. J.L.B. Smith Inst. Rhodes, Grahamstown.

Follow the Footsteps SA's Hiking Trails, Satour 1985.

Kruger - Portrait of a Park by David Paynter and Wilf Nussey. Macmillan 1987.

First Aid - Anywhere, Anytime by Cyril Tucker, SA Pharmaceutical Society 1987.

Recommended Reference Books

Trees:

Trees of Southern Africa by Eve Palmer and N. Pitman in 3 volumes (Balkema 1972).

Trees of Southern Africa by K.C. Palgrave. (Struik 1977).

A Field Guide to the Trees of Southern Africa by Eve Palmer (Collins 1977).

Birds:

Roberts' Birds of South Africa revised by G.L. Maclean (John Voelcker Bird Book Fund 1984).

Newman's Birds of Southern Africa by K.B. Newman (Macmillan 1983).

Field Guide to the Birds of Southern Africa by Ian Sinclair (Struik 1984).

Mammals:

Mammals of the Southern African Sub-region by Reay Smithers (University of Pretoria 1983).

Maberley's Mammals of Southern Africa (a field guide) revised by Richard Goss. (Delta 1986).

Snakes:

Snakes versus man by Johan Marais (Macmillan 1986).

Snakes of Africa by R.M. Isemonger (Books of Africa 1982).

A Field Guide to the Snakes of Southern Africa by V.F.M. Fitzsimons (Collins 1970).

Snakes and Snakebite by J. Visser and D.S. Chapman (Purnell 1978).

Chapter Fourteen

The tough and the gentle

"What is life if full of care,
We have no time to stand and stare?"

William Henry Davies

One sometimes wonders if there can be a land with a variety of trails as varied as South Africa's. I have attempted to catalogue a few of the popular ones and to classify them so that the reader can gauge whether he or she is capable of walking them.

*** Only for the fit

** For those of average health

* Suitable for all ages

OH Overnight hut

C Camping allowed

P Permit required

AT Accompanied trail

UT Unaccompanied trail

M Malaria risk

Transvaal (including adjacent areas)

ABE BAILEY NATURE RESERVE, CARLETONVILLE, WESTN TVL. (*), AT/ P/ OH. 7 000 ha of highveld/bankenveld savannah and wet land; educational facilities; plains game; 200 sp. of birds. Open only to wildlife society members. Wildlife Society, PO Box 44189, Linden 2104.

BABOON TRAIL, MIDDELBURG, E TVL. (**) OH/P/UT. 30km trail over Olifants River (2 day) or **CYCAD TRAIL** 14km. Rare plants, 170 sp. of birds. PC Oberholzer, PO Box 1326, Middelburg 1050.

BARBERTON GOLD NUGGET TRAIL, E TVL. (**) C/OH/P/AT/M. Approximately 40km 2-day trail in middelveld/bushveld grassland trail. Aloes and proteas, archaeological site (mining), 250 sp. of birds. Also FORTUNA MINE ROTARY NATURE RESERVE. (*) Circular UT walk through indigenous trees (labelled) and mine tunnel (torch needed). See world's oldest known rock. Barberton Publicity Association, PO Box 221, Barberton 1300.

BEN LAVIN NATURE RESERVE, N TVL. (*) C/OH/P/AT/UT. 12km from Louis Trichardt. Four trails, max 8km. 2 500 ha mixed bushveld, plains game and 210 sp. of birds. Ben Lavin Reserve, PO Box 782, Louis Trichardt 0920.

BLYDE RIVER CANYON (BLYDERIVIERSPOORT), TVL. (**) (***) C/OH/P/UT/M. 65km of trails from 4 to 10km, some strenuous, along and down escarpment of Transvaal Drakensberg. Full trail is 5 days long. Botanically rich, mountain grassland, lush and deep forest pockets. Magnificent views, 250-270 sp. of birds, wildlife, archaeology. Best in early winter. Excellent public resorts. See also Fanie Botha Trail. Regional Director of Forestry, Private Bag X503, Sabie 1260.

BRAAMFONTEIN SPRUIT TRAIL, JOHANNESBURG. (*) UT. 32km highveld suburban trail includes Melville Koppies (archaeological), Emmarentia Dam (botanical), Delta (Birdlife). Braamfontein Spruit Trust, PO Box 78095, Sandton 2146.

CHEETAH TRAIL. See Suikerbosrand.

CYCAD TRAIL. see Middelburg Cycad Trail.

ELANDSKRANS HIKING TRAIL, E TVL. (**) OH/UT/P. 2-day, 16km hike or 1 day ramble in Waterval Boven district in mountains, grassveld, bushveld, forested valley with waterfalls. 250 sp. of birds. Town Clerk, Waterval Boven, PO Box 53, Waterval Boven 1195.

FANIE BOTHA HIKING TRAIL, SABIE, E TVL. (***) OH/P/UT/M. 77km trail with sections 3-5 days through steep pine plantations, natural forest, grassland, escarpment views, excellent bird/butterfly life. Many waterfalls. On National Hiking Trail, joins Blyde River Trail. Winter cold, take water. Dept. of Forestry, Private Bag X313, Pretoria 0001. (see also Loerie Nature walk).

FORTUNA MINE TRAIL - see Barberton.

GIRAFFE TRAIL, N TVL. (**) OH/P/UT/M. 35km, 3-day bushveld trail through Hans Marensky Reserve, Wildlife, birdlife on Groot Letaba. Hans Merensky Nature Reserve, Private Bag X502, Letsitele 0885.

IVORY TRAIL - see Tuli Block.

JOCK OF THE BUSHVELD TRAIL, E TVL. (*) OH/P/AT/M. Bushveld trail 5 days adults, 6 days children, on west border of Kruger National Park. Big game, excellent birdlife in Hans Hoheisen Private Game Reserve. Wilderness Leadership School, PO Box 15035, Bellair 4006.

KAAPSCHE HOOP HIKING TRAIL, E TVL. (**) OH/P/C/UT. In the Berlin State Forest near Waterval-Onder. Rich botanical variety, birds and mining (gold) archaeology. Part of National Hiking Way. Includes 3-day walk plus two shorter ones. Regional Director, Private Bag 11201, Nelspruit 1200.

KLASERIE LION AND ELEPHANT TRAIL, E TVL. (**) OH/P/AT/M. 3 -day trail over 60 000 ha lowveld. High quality camping, big game. Educational Wildlife Expedition, PO Box 645, Bedfordview 2008.

KLEIN AASVOGELKRANS, MIDDELBURG, E TVL. (including Botshabelo Nature Walk). (*) OH/UT. Middelveld/bushveld half-day to day walks; good botany and birds. 5 sp. of antelope. Archaeology. Town Clerk, PO Box 14, Middelberg 1050.

KLOOFENDAL HIGHVELD PARK, ROODEPOORT, WITWATERSRAND. (*) UT. Highveld walk (free) of botanical, archaeological and geological interest. Wildlife Society, PO Box 44344, Linden 2104.

KRUGER NATIONAL PARK, E TVL. (**) C/OH/P/AT/M. 2 million ha of prime lowveld/bushveld offering several 3-day trails among big game. High class camping. Necessary to book a year ahead. Maximum opportunities for bird watching (440 sp.), wildlife, botany, archaeology. National Parks Board, PO Box 787, Pretoria 0001.

KRUGERSDORP GAME RESERVE, CEN TVL. (*) OH/P/AT. Highveld/bushveld. Trails up to 10km, see plains game and birdlife. Good resort. Lion, rhino, buffalo fenced off. Wildlife Society, PO Box 1064, Krugersdorp 1740.

LAPALALA TRAIL, WATERBERG MOUNTAINS, N TVL. (*) OH/AT/UT/P. Various bushveld trails (adults and children) in 5 400 ha mountain grassveld. Antelope, excellent birdlife (250 sp.). Good weekend trails (2 1/2 days) plus educational. Educational Wildlife Expedition, PO Box 645, Bedfordview 2008.

LETABA TRAIL, E TVL. (*) C/OH/UT/M. Various scenic bushveld trails south of Tzaneen. Big game and birds. Archaeological and botanical interest. Best time: winter. Division of Nature Conservation, Transvaal Province, Private Bag X209, Pretoria 0001.

LIMPOPO - see Mashatu.

LOERIE NATURE WALK, E TVL. (*) C/UT/M. Indigenous high forest. Large variety of birds and waterfall scenes. Winter can be very cold, summer hot. Trail 13.5km or 4km circular . Adjacent to Fanie Botha Trail (qv). Dept. of Forestry, Regional Director, Private Bag X503, Sabie 1260.

MABUDASHANGO, VENDA.(**) C/P/UT//M. 54km, 4-day bush and forest near Sibasa. Dept. of Agriculture, Private Bag X2247, Sibasa 0970,Venda.

MAGALIESBURG, C TVL. (**) C/OH/P/AT. Most of 120km range is in private hands but has a few caravan and camping grounds. Rustenburg Hiking Trail (20km) along ancient quartzite escarpment and highveld savannah with plentiful wildlife, 150 sp. of birds and interesting plant life. Dept. of Nature Conservation, PO Box 511, Rustenburg 0300.

MAGOEBASKLOOF HIKING TRAIL, N TVL. (**) OH/P/UT/C. Links Wolkberg (Prester John fame) to deeply-wooded Magoebaskloof and includes highest forest in South Africa and great variety of indigenous trees. Wildlife, birdlife. Two trails, 36km and 28km. both circular. Dept. of Forestry, Private Bag X2413, Louis Trichardt 0920.

MANYELETI GAME RESERVE, E TVL. (**) OH/P/AT/M. Popular black (but not exclusively) bushveld trail area with big game (elephant, lion, etc) and 350 sp. of birds. Good resort. Manyeleti Reserve, PO Manyeleti 1362.

MASHATU GAME RESERVE, BOTSWANA. (*)(**) OH/P/AT/M. Nort h of Limpopo River, vast lowveld area rich in big game, bird-life (350 sp.) and archaeological treasures. It is reached by cable-basket across Limpopo and air from Transvaal at Pont Drift. Several trails. Marketing Manager, Mashatu, PO Box 32501, Braamfontein 2017.

MIDDELBURG CYCAD TRAIL, E TVL.(*)(**) ON/UT/P. A middelveld trail of 14km which interlocks with 30km Baboon trail (qv). Best between August and May. Prolific birds and small game. PC Oberholzer, PO Box 1326, Middelburg 1050.

MORELETA SPRUIT TRAIL, PRETORIA EAST. (*) UT. 27km of suburban to rural river trail rich in indigenous trees and birdlife.

MORGENZON TRAIL, E TVL.(**) (***) P/OH/UT. Mountain grassland, bush and pine plantations near Pilgrims Rest. A little game and interesting birds and rock formations. Figure-of-eight trail which brings one back to car. Rough going in places and best in spring. Regional Director, Private Bag X503, Sabie 1260.

MOUNT SHEBA NATURE RESERVE, E TVL. (**) UT. Hotel-owned area comprising several trails into 1 500 ha of mountain grassland above

Pilgrims Rest. Small game plus birdlife. Mount Sheba Hotel, PO Box 4, Pilgrims Rest 1290.

NELSPRUIT CROCODILE RIVER TRAIL, E TVL. (*) UT/M. A brief but exceptional educational trail with 500 tree sp. and 250 bird sp. in National Lowveld Gardens. National Botanic Gardens, Kirstenbosch, Private Bag X7, Claremont 7735.

NYLSVLEI TRAIL, N TVL.(*) OH/P/AT. World famed wetland bird area (c 400 sp.) in Nylsvlei flood plain. Plains game. Trail lasts 2 days. Best in Spring-Summer. Doorndraai Dam Nature Reserve adjacent and has rare tsessebe, sable as well as other wildlife including fish eagle and other eagles. Wilderness Leadership School, PO Box 15036, Bellair 4006.

PILANESBERG TRAIL, BOPHUTHATSWANA. (*) C/P/OH/UT/AT. Various trails in game filled, bird-filled crater area of grassveld, wetland, bushveld and mountain vegetation. North of Rustenburg. Pilanesburg National Park, PO Box 1201, Heystekrand 0302, Bophuthatswana.

ROOIKAT TRAIL, TZANEEN, N TVL. (**) P/UT/M. 12 km circular trail through sub-tropical forest. Rare birds plus all three species of SA monkeys. State Forester, Private Bag 4009, Tzaneen 0850.

RUSTENBURG TRAIL - see Magaliesburg.

SABI SAND TRAILS, E TVL. (*) (**) OH/AT/P/M. Various trails through lowveld big game country. Lion, elephant, buffalo, etc. 300 sp. of birds. Sabi Sand, CC Box 99, Carlton Centre, Johannesburg 2000.

SOUTPANSBERG, N TVL. (***) C/OH/UT/P. A five day 91km National Hiking Way mountain ridge trail (shorter lengths can be done) through grassland, tropical indigenous forest and bush, 350 sp. of bird. Best in winter but nights cold. Dept. of Forestry, Northern Tvl, Private Bag 2413, Louis Trichardt 0920.

SUIKERBOSRAND HIKING TRAIL, S TVL. (**) C/OH/UT/AT/P. 80km of highveld mountain trail, grassland with forest patches, plentiful game, 200 sp. of birds and archaeological sites. Suikerbosrand, Private Bag H616, Heidelberg 2400.

TIMBAVATI, E TVL. (**) (*) OH/AT/P/M. Various bushveld trails (1 day to 5 day) in this privately-owned big game region abutting Kruger Park. 400 sp. of birds. Educational Wildlife Expeditions, PO Box 645, Bedfordview 2008.

WOLKBERG, N TVL. (***) C/P/UT/OH. Rugged mountain terrain, good climbing and walks in wilderness area including gorges, high canyon forest, waterfalls. Prester John country. Geologically important. Wil-

dlife and 250 sp. of birds. (Magoebaskloof trail nearby). Dept. of Forestry, Private Bag X4009, Tzaneen 0850.

WONDERKLOOF RESERVE, E TVL. (**) UT/P. Day hikes through indigenous montane forest. 250 sp. of birds. Archaeological sites and Starvation Creek Reserve with 90m waterfall. Dept. of Forestry, Private Bag X503, Sabie 1260.

Orange Free State

BRANDWATER TRAIL, E OFS. (**) P/C/OH/UT. 68km, 5-day trail in beautiful scenery and high grass savannah. Town Clerk, Fouriesburg. OFS.

RHEBOK TRAIL, E OFS. (**) P/CP/UT/OH. Golden Gate area, 30km game-filled rugged mountain trail up to 2 757m in altitude. Caves, wild flowers, 200 sp. of birds inc. lammergeier. Best March-May and August-October. National Parks Board, PO Box 787, Pretoria 0001.

WITSIESHOEK, E OFS (*) (**) (***) C/OH/UT. High and steep alpine grassveld rich in plantlife, variety of climbs from mild to severe. Dangerous in winter because of sudden cold and snowfalls. Wildlife and birdlife. Witsieshoek Hotel, c/o Private Bag 661, Bergville 3350.

Natal

DRAKENSBERG TRAILS, W NATAL. (**) (***) P/OH/UT/C. Hundreds of kilometres of trails (mostly strenuous) and climbing routes below, up and on top of the 'Berg. The area is dominated by a high basalt wall towering above the sandstone of the Little Berg with its "2 000m contour path". Wildlife and archaeology plentiful. Trails too numerous to mention. See "Trailing and Mountaineering in South Africa" by Jaynee Levy (Struik), "Barrier of Spears" by R.O. Pearse (Timmins), "Mountain Odyssey" by David Coulson and James Clarke (Macmillan).

ITALA, N NATAL. (**) OH/C/P/AT/M. Near Louwsburg. Scenic 4-day trail south of Pongola River in game-filled hills and forest patches. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

ISIKHOVA TRAIL - see St. Lucia.

KRANTZKLOOF, C NATAL. (*) P/UT/AT. (Kloof). 20km of trail through forested gorge, falls, wildlife, 200 sp. of birds, botanical interest. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

NDUMU, ZULULAND. (*)(**) P/C/OH/AT/M. Beautiful wetland trail with well over 400 sp. of birds as well as crocodile, hippo and tropical wild life including two species of rhino. Non-demanding trails. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

NGELE HIKING TRAIL, S NATAL. (**) P/OH/UT. 60km circular 4-5 day route through Natal highlands near Harding. Thickly forested kloofs, good birdlife and botany. 880m ascent (***) of Ngele mountain from which one can see deep inland and to the sea. Regional Director of Forestry, Private Bag 9020, Pietermaritzburg 3200.

NTENDEKA, ZULULAND. (*) P/OH/UT. Botanically, geologically and archaeologically important wilderness area with wildlife (antelope) and birdlife. Forester, Ngome State Forest, Private Bag X1306, Vryheid 3100.

MKUZI, N ZULULAND. (**) C/P/OH/AT/M. 3-day trail and (through April-October) day walks through thornveld. Plentiful wildlife, 400 sp. of birds. Botany excellent. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

ORIBI GORGE, S NATAL. (**) C/P/OH/UT. Near Port Shepstone. Trail goes along 24km, 300m deep sandstone gorge carved in coastal upland by Umzimkulwana River. Wildlife and birds. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

ST LUCIA, ZULULAND. (*)(**) C/P/OH/UT/AT/M. Several kinds of trail around vast salt water/fresh water dual ecology estuary including 5-day St Lucia trail through bird-filled wetlands and coastal forest. Also 3-day Mziki trail (22km). Crocodiles, hippo and other game and 250 sp. of birds, some in vast numbers. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

SPIOENKOP, C NATAL. (*)(**) C/P/OH/UT. Historical trail through wildlife-filled grassland to famous SA War battleground. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

UMFOLOZI, ZULULAND. (**) C/P/OH/AT/M. Various trails but principally the famous 5-day White Rhino Trail on foot and by canoe rich in wildlife and archaeology and similar 3-day trail through big game country comprising, thornveld, plains, hills and gorges. Two species of rhino plus lion, giraffe, elephant, etc. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

UMLALAZI, N NATAL. (**) C/P/OH/UT/M. Botanic trails 2 to 8km in length to see mangrove swamp, dune forest and crocodile-infested Umlalazi River. Excellent birdlife. Natal Parks Board, PO Box 662, Pietermaritzburg 3200.

Transkei

WILD COAST. (**)(***) C/P/UT. About 280km (say 2-weeks walking) along one of the world's wildest beaches. Dune forests, fynbos patches, rich birdlife, fishing. Beware of sharks and boil all water. Nature Conservation Dept. Private Bag X5002, Umtata, Transkei.

Cape Province

There are many trails in the southern fold mountains of the Cape. The best books on these are: "Latest walks in the Cape Peninsula", "Trails and Walks in the Cape Peninsula" and "Trails and Walks in the Southern Cape" by J Burman (Human and Rousseau). "Trailing and Mountaineering in South Africa" by Jaynee Levy (Struik).

SOUTH WESTERN CAPE. (*) (**) (***). All facilities and numerous trails and climbs of varying degrees of difficulty including several dozen trails and one day walks in Cape Peninsula and in municipal Cape Town and on and around Table Mountain. Main features of this region are its unparalleled floral variety (fynbos), magnificent scenery and historical features.

AUGRABIES FALLS, NW CAPE. (**) P/C/OH/UT. 26km, 3-day trail in semi-desert. Gorge cut by Orange River through granite, is 18km long and falls 93m. Best time spring or autumn. Good birdlife. Take water and sun hat. National Parks Board, PO Box 787, Pretoria 0001.

AMATOLA, E CAPE.(***) P/C/OH/UT. Demanding 27km, 2-day trail through indigenous climax forest in mountains. Good birdlife, wildlife, botany (in particular) and archaeology. Also historically and botanically interesting 12km walk (Pirie walk) is part of National Hiking Way. See also Hogsback. Dept. of Forestry, Private Bag X501, Zwelitsha 5608, Ciskei.

BOLAND TRAIL, W CAPE.(***) P/OH/UT. 55km, 2 1/2 day, National Hiking Way trail (with shorter variations) through prime fynbos region in Hottentots Holland Mountains. Weather capricious often calling for great hardiness (Levy says several deaths). Regional Director, West Cape Forest Region, Private Bag 9005, Cape Town 8000.

CAPE OF GOOD HOPE TRAIL, C. PENINSULA.(*) UT. Various unmarked walks, excellent wildlife, birds, flora. Cape Divisional Council, PO Box 1073, Cape Town 8000.

CEDARBERG, W CAPE.(**) P/OH/UT. Rugged, highly scenic mountain chain with steep trails covering 71 000 ha; unusual rock formations and rare plants. Best time September-March. The Forester, Cedarberg State Forest, PO Citrusdale 7340.

DE HOOP, W CAPE.(**) P/OH/UT. Access limited at present (1987) but imminently 75km of prime fynbos trails to be opened. Wildlife includes Cape mountain zebra and well over 200 sp. of birds. Some trails, 4-6km, already open. Director, Nature Conservation, Private Bag 9086, Cape Town 8000.

DU TOITS KLOOF, W CAPE.(**) (***) P/OH/UT. Several trails, mostly rugged but botanically rich and many bird species. Department of Forestry, Private Bag 9005, Cape Town 8000.

ELEPHANT WALK, S CAPE.(**) P/UT. 15km trail through remnant of original Knysna Forest with vague chance of seeing Knysna elephant. Some memorable trees including large yellowwoods and stinkwood. Department of Forestry, Diepwalle, Private Bag X85, Knysna 6570.

FISH RIVER TRAIL, E CAPE.(**) P/UT/AT. 38km (2 1/2 day) trail through botanically rich area including forest, bush and Umkiwane Gorge. Large game plus variety of unusual birds. Shorter (28km) trail. Officer in charge, Private Bag X1534, Grahamstown 6140.

GOUKAMMA, S CAPE.(**) P/UT. 50km of lovely coastal trail, angling (swimming dangerous) take own water. Coastal shrub and fynbos. Department of Nature Conservation. Private Bag X9086, Cape Town 8000.

GROOTKLOOF, S CAPE.(**) UT. 10km of high forest and fynbos, part of National Hiking Way. Part of Tsitsikamma Hiking Trail. Regional Director, Private Bag X37, Humansdorp 6300.

HERMANUS, W CAPE. (*) (**) P/C/OH. Variety of trails including privately-owned Vogelgat which has 500 species of plants (fynbos) and birdlife (Dr I Williams, 29 Tenth Streets, Voelklip 7203); 27km of cliff paths along sea and Fernkloof Reserve with 25km of fynbos hillside trail. Town Clerk, PO Box 20, Hermanus 7200.

HOGSBACK (& KATBERG), E CAPE.(*) (**) (***) P/C/OH/UT. Many kilometres of trails through both Hogsback and Katberg state forests sometimes coinciding with National Hiking Way. Botany, birds and some good climbing. For Hogsback: Department of Forestry, Eastern Cape, PO Box 119, King Williamstown 5600. For Katberg: Department of Agriculture, Private Bag X501, Zwelitsha 5608, Ciskei.

KEURBOOMS RIVER, S CAPE.(*) C/OH. 5km, trail through yellowwoods of lower Tsitsikama mountains. Rare birds include narina trogon. Department of Conservation, Private Bag 9806, Cape Town 8000.

KAROO TRAILS, CAPE.(*) (**) C/P/OH. Various trails over extensive area of arid flatlands but with magnificent scenery, birdlife and wild animals. Karoo Nature Reserve adjacent to Graaff Reinet includes dramatic dolerite formations (Karoo Nature Reserve, PO Box 347, Graaff Reinet

6280). 40km of rugged Karoo at Springbok Trail in Karoo National Park, Beaufort West (National Parks Board, PO Box 787, Pretoria 0001). 40km of trail (3 days) in Black Eagle Trail, Queenstown which is good for birds and other wildlife. (Department of Nature Conservation, Private Bag 9806, Cape Town 8000). For more information refer to "Trailing and Mountaineering" by Jaynee Levy.

MOUNTAIN ZEBRA NATIONAL PARK, CAPE.(**) P/C/UT. 32km, 3-day trail through undulating Karoo vegetation, bushman paintings, large animals and excellent birdlife. Must carry water. Can be very cold in winter and hot in summer. National Parks Board, PO Box 787, Pretoria 0001.

OTTER TRAIL, S CAPE.(***) P/C/OH/UT. Famous 41km, 5-day coastal trail entailing sometimes difficult crossing of Bloukrans River. Part of National Hiking Way it travels through magnificent pocket forests, caves, waterfalls, tidal pools, interesting birdlife (210 species) and large animals. Book 6 months ahead. National Parks Board, PO Box 787, Pretoria 0001.

OUTENIQUA TRAIL, S CAPE.(*) (**) (***) C/UT/OH. Almost 150km of trail (8 days) through South Africa's best indigenous forest, some montane fynbos and rich birdlife. Includes part of National Hiking Way. Regional Director, Private Bag 12, Knysna 6570.

PERDEBERG, W CAPE.(**) P/UT. 15km, trail through beautiful fynbos scenery with long view and 10km. Three Sisters Walk which includes steep climb. Good variety proteas and birds. Regional Director, Private Bag 9005, Cape Town 9000.

RIVIERSONDEREND, W CAPE.(***) P/UT. Rugged Canyon Trail of about 9km through magnificent scenery, rich fynbos, wetland. Good bird life. Adjoins Hottentots Holland mountains. The Forester, Nuweberg State Forest, PO Box 81, Elgin 7180.

SWARTBERG, S CAPE.(***) P/C/UT. 12km long (say all day) rugged trail with magnificent mountain scenery and good variety of birds plus wild life. Regional Director, Private Bag 6570, Knysna 6570.

SWELLENDAM, W CAPE.(**) (***) P/C/P/OH/UT. More than 80km of trail (6 days leisurely) through rugged and steep terrain including deep forest, cliff tops and montane fynbos. Winter can be cold and wet and even bring snow. Part of National Hiking Way. Regional Director, PO Box 9005, Cape Town 8000.

THOMAS BAINES, E CAPE.(**) P/AT. 2-day trail near Albany through bushveld and hills with good variety of birds and large mammals including white rhino. Department of Nature Conservation, Private Bag 9086, Cape Town 8000.

TSITSIKAMMA TRAIL, S CAPE.(*) (**) (***) P/C/OH/UT. Several short trails through coastal scenery, forest, fynbos and tidal pools but also longer trails including Otter Trail (qv) and National Hiking Way's 61km trail which is at a higher elevation than Otter Trail passing through rain forest up into fynbos slopes. Regional Director, PO Box 12, Knysna 6570.

TEST DRIVE A LAND ROVER ONE TEN TODAY. TELEPHONE:

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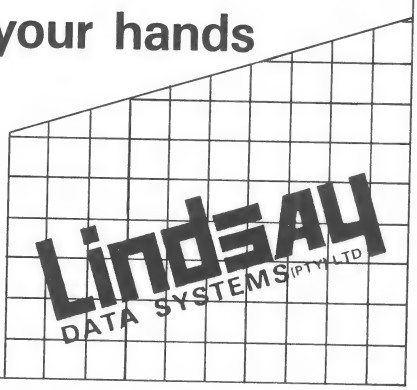

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